USER-FRIENDLY STREET IN MALAYSIA

NORHAFIZAH ABDUL RAHMAN
BSc .Hons HBP (Architecture)
MSc (Landscape Architecture)

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ABSTRACT

There has been a growing concern in Malaysia towards promoting streets that are friendly to all users due to the streets environment which are perceived as not friendly to pedestrians. Based on previous research, nowadays, people are more ready to walk than before if streets are improved to meet the needs of the users. The aim of this research is to identify the factors and attributes that make a street friendly to the users. The research employed a mixed methodology using a case study approach. Jalan Tuanku Abdul Rahman, as one of the main urban commercial streets in city centre of Kuala Lumpur was selected based on the physical, functional and socio-cultural characteristics of the street. A sample survey and in-depth interview were conducted with residents of Kuala Lumpur city centre. This was supported by field observations using scheduled checklists, photos and maps procedures. Analysis was conducted by means of triangulation. The research has found that the factors that affect the level of friendliness of streets to the users are attractiveness, activities, congestions, proximity and familiarity. The findings also indicate five supportive factors that affect the level of friendliness of the street; public space, greenery/trees, maintenance, public amenities and freedom of action. There are three main qualities that affect the level of friendly-street; safety and security; comfort and convenience, and accessibility. Based on the research done, safety and security are the most important qualities that contribute to the user-friendly urban commercial street; it is followed by comfort and convenience and accessibility. There is also a difference between the level of importance of attributes between different types of user, age groups and distance from place of residence to the user-friendly streets. It is found that the level of importance of factors and attributes is different from previous research. These findings contribute the gap in the knowledge concerning the most important needs and users' perception of a friendly urban commercial street based on the situation in Malaysia which has a different climate, social activities and cultural context from other previous researches.

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TABLE OF CONTENTS

LIST OF TABLES

CHAPTER 2

CHAPTER 3

CHAPTER 4

CHAPTER 6

CHAPTER 7

LIST OF FIGURES

LIST OF TERMS

Jalan	Road/ Street
Padang	Green open space
Kaki lima	Arcaded walkway that form part of the building
Shophouse	A building type with retail units at the ground floor and residential in the upper floors
Kuala	Estuary
Bandar	Town
Kapitan	Leader of the Chinese Community
Kopiah	Rounded cap- Muslims do wear for religious purposes
Nasi Padang	A miniature banquet of meats, fish, vegetables, and spic sauces eaten with plain white rice (Indonesian cuisine)

LIST OF ABBREVIATIONS

NUP	National Urbanisation Policy
JTAR	Jalan Tuanku Abdul Rahman
CBD	Central Business District
JBPD	Jabatan Perancangan Bandar dan Desa (Department of Urban and Rural Planning)
DBKL	Dewan Bandaraya Kuala Lumpur (Kuala Lumpur City Hall)
ITE	Institute of Transportation Engineers.
GTP	Government Transformation Programme

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This research identifies the notion of a user-friendly street in the context of an urban commercial street in Kuala Lumpur city centre. The primary concern is to identify the factors that make a street user-friendly, to examine attributes and characteristics and to determine the similarities and differences of a friendly street in respect of users from different types of user and socio-demographic background. This research explores the notion of a user-friendly street, as defined by Jacobs et al. (1961), Whyte (1980), Tibbalds (1990), , Shamsuddin et al. (2000, 2007) and Yaakub et al. (2009) to name a few. The user-friendly street is associated with the quality of the space that fulfils the needs of all the users (Tibbalds, 1990; Jacobs, 1996; Shamsuddin, 2000). A user-friendly street is a street that is easy to use, accessible and barrier free (Oxford 1993; Whyte, 1980; Carrs et al., 1992; Jacobs 1996; Yaakub et al., 2009), safe (Jacobs et al., 1961; Whyte, 1980; Carmona et al., 2003; Yaakub et al., 2009); and provides comfort and convenience (Lynch, 1981: Jacobs, 1996). Shamsuddin et al. (2007) added that in the Malaysian context, user-friendly is also related to the functional balance among human needs, environmental factors and financial constraints.

This research was conducted in the context of an urban commercial street in a city centre. The street chosen was Jalan Tunku Abdul Rahman (JTAR), which is one of the main urban commercial streets in the main commercial district of Kuala Lumpur. The street is occupied by users with diverse personal and socio-cultural characteristics in which the key cultural groups are Malay, Chinese and Indian. The details of the case study are explained in Chapter 5. This research is important in making urban spaces, generally, and streets, specifically, liveable and useful to all groups of users.

This chapter presents an introduction to the research. It is divided into four parts. The first part explains the research background and issues that trigger the research. The second part describes the aim, objectives and the questions generated from the identified issues and the assumptions of the study. The third part briefly describes the research approach and the scope and limitations of research. The last part presents the overall structure of the thesis.

1.1 The Background

In most of the cities in Malaysia, streets are a vital component of the urban form and the most public of all city spaces that are utilized by all city dwellers. The 'user-friendliness' of a street is an important factor in order to bring people on to the street. However, many streets are not friendly to their users. Research has shown that people are prepared to walk more if there is an improvement to the public space (Papaionmou et al., 2007; Yaakub, 2006; Gehl, 2008; and Gehl, 2010). According to Sulaiman (2000), the existing trend of design in Malaysia mainly focuses on individual buildings and less attention is given to the design of outdoor spaces because of the lack of understanding in urban design and people's needs in urban spaces. Hence, currently, in Malaysia we do not find examples of street environments that are friendly and accommodating to the users (Yaakub, 2006).

1.1.1 Statement of Issues

Urban design issues in relation to a user-friendly urban commercial street, which are viewed from both global and local perspectives, are used as the framework for this research.

a) Global Issues

Over the past century, the urban environment has steadily declined in most cities and suffers from being inhuman (Forsyth et al., 2008). This contributes to the unfriendly street environment presented to the users. Gehl (2008) argued that in many cities, the qualities of the streets (such as free of obstacles – sidewalk interruptions, curbs and appalling street crossings, obstructions left on the narrow side walk) for pedestrian street users in many cases are unpleasant and unfriendly. Around the world, people have been returning to the centre, and with the growth in the global population and rise in inner city migration, almost half of the world's population is already living in cities (Loukaitou Sideris et al., 2009; Lim, NST, 2011). Loukaitou Sideris et al. (2009) also added that cities have taken the initiative to attract people back to the downtown areas and to revitalize the abandoned parts of the cities. Street issues have become an important topic globally as streets, as part of the urban environment, that has human concentration and urbanisation process has led to an increase in the urban population. Hence, the rapidly increasing concentration of people in the urban areas along with the focus on improving the quality of life, and revitalising city centres, have led to increased attention concerning the quality

of urban open spaces that fulfil the users' needs (Forysth, 2003, 2008). As the population increases, the numbers of the vehicles in the city also increases. As a result, most streets in urban areas around the world suffer from the domination of private vehicles (Tsourlarkis, 2005). Papaionmou et al. (2007) argued that many drivers often ignore pedestrians, especially vulnerable users, such as children, people with baby carriages, the elderly and others with special needs, as the drivers always claim through practice that they have exclusive use of the road networks (Papaionmou et al., 2007). As traffic congestion and air pollution are becoming problems in many cities worldwide, agencies at all levels are showing increased interest in promoting non-motorized travel options. Many communities across the globe have started seeking ways to increase pedestrian activities and discourage automobile dependency (Sisiopiku et al., 2003).

Another issue that has led to the unfriendly street environment in urban centres is the lack of understanding of the needs of the current users in specific contexts (Moughtin, 1992; Knox, 2005). The understanding of the needs of those who cannot use the places is also important to investigate in order to identify the reasons why the street is not friendly to them. Southworth (2002) argued that public spaces, such as streets, squares and promenades are the most important form of social infrastructure in urban settlements, particularly in the lives of poorer people, whose housing is often too small for household needs.

In order to understand the human need for public space, an understanding of basic human needs is important. Moughtin (1992) and Gehl (2008) contended that the task of the urban designers is to understand and express in built form, the needs and aspirations that best serve the needs of the community to ensure that the end product is culturally acceptable. Hence, by understanding the contextual needs and users' actual behaviour in space (how they use the streets), a remedy leading to the improvement of the streets can be made (Gehl, 2008). Therefore, this research seeks to identify the current needs of street users in the specific context.

Much research has been done by researchers about related issues, which have been widely debated in the international arena. The urban studies on street qualities, as pertaining to the perceptions, needs and use of pedestrians, have been from multi-disciplinary areas, such as, Jacobs (1996), Dumbaugh (2005), Gehl (2008) and Mehta (2007, 2009) in urban planning and urban design; Appleyard (1972, 1981 and 1983), Sisiopiku (2003) and Bernhoft et al. (2008) in transportation; Naderi (2005) and Knack (2008) in landscape; and Craig (2003), and Bourbia (2009) in the environment and health.

Most research related to the street qualities that can encourage the use of the street – liveable street, walkable, accessible street, safe and comfortable; the relationship between the street environment and users' behaviour; and user's perceptions of what constitutes a good street. Furthermore, most studies focused on community, neighbourhood streets and not on commercial streets. Hence, most of the studies did not trace the needs of different types of user and different socio-demographic backgrounds in the specific context, thus, creating a gap in the existing research.

The urban growth process can be defined as the process of increasing the urban population, in which understanding the relationship between the people and their environment is essential in urban design (Carmona et al., 2003; Gehl, 2008; Mehta, 2009). The main tasks for urban designers include the understanding and knowledge to express the needs and aspirations of the users in built form, designing to best serve the community's needs and ensuring that the end product is culturally acceptable (Moughtin, 1992). Accordingly, urban planning that takes into consideration cultural and economic factors will increase the quality of life of urban people; and the urban area, as a focal space for humans, must fulfil the basic human needs, such as providing living space and jobs.

b) Local Issues

Malaysia comprises thirteen states, and two federal territories (Figure 1.1). Kuala Lumpur, which is the capital city of Malaysia, has a land area of 243 sq.km and a population of 1.42 million (Government of Malaysia, 2000), which is expected to increase to 2.2 million people by 2020 (Kuala Lumpur Draft, 2003). The ethnic classification of the population of Kuala Lumpur (Government of Malaysia, 2000) includes Malays (38%), Chinese (43%), Indians (10%) and others (9%). The high population and housing density, together with multi-cultural diversity, has presented major challenges in creating good urban areas for public use.

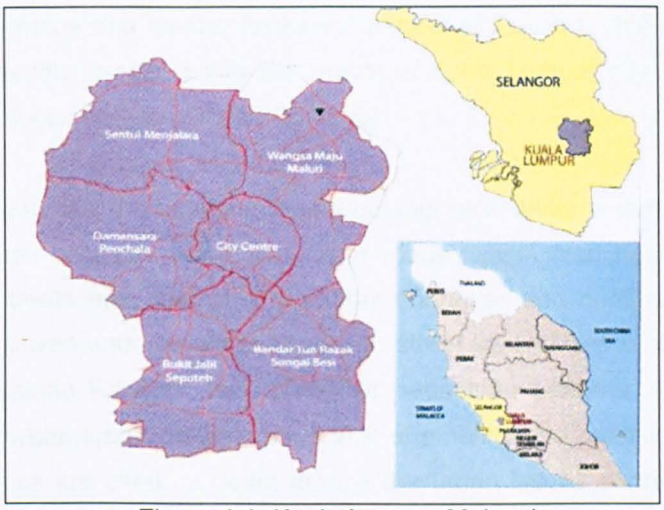


Figure 1.1: Kuala Lumpur Malaysia

Source: DBKL (2003)

Current issues in Malaysia that relate to creating friendly urban commercial streets include the Government Transformation Programme (GTP, 2010). This programme is a government plan containing objectives and targets to transform Malaysia in accordance with the nation's vision for 2020. The GTP contains six national key result areas (NKRA's), of which two NKRA's with direct emphasis on user-friendly streets are improving urban public transportation and reducing crime (GTP, 2010). Similarly, the Economic Transformation Programme (ETP), which is a roadmap to raise Malaysia's Gross National Income (GNI), contains twelve National Key Economic Areas (NKEA's). NKEA's with direct emphasis on friendly streets in Greater Kuala Lumpur and the Klang Valley area include an integrated urban rail system, establishment of economic places and pedestrian networks, and the creation of a greener KL (GTP, 2010).

In Malaysia, when talking about public open spaces in the city centre, streets, especially urban commercial streets, play an important role due to the lack of other types of urban space (DBKL, 2003). The quality of outdoor urban spaces plays an important factor in the quality of life within cities (Makaremi et al., 2012). However, currently, in Malaysia one cannot find many examples of street environments that are friendly and accommodating to all users (Yaakub, 2006). Comments made by one of the street users suggest that a lot could be done to improve the street environment in Kuala Lumpur city centre to ensure that it is more pleasant for pedestrian users (Chan, 2011). One of the users added that the streets in the city were not user-friendly as the streets were not suitable for the physically disabled or parents using strollers (Chan, 2011). The Draft Kuala Lumpur Structure Plan 2020 (DBKL, 2003) under Urban Design and Landscape includes efforts to develop a policy framework and guidelines to create a desirable living environment and

appropriate city image and identity for Kuala Lumpur city centre. One of the issues that relate to user-friendly streets is that the streets in Kuala Lumpur city centre have been developed in a piecemeal fashion (DBKL, 2003).

In conjunction with this, the streets in Kuala Lumpur lack clarity in terms of linkages and movement pattern between major and minor roads, which also has an effect on the quality of the streetscape, that is, the overall character and continuity of streets, as represented by pavements, buildings frontages, street lighting and other street furniture. The weak pedestrian linkages, lack of legible pedestrian patterns, weak continuity of pedestrian and urban space linkages, and lack of amenity and provision for pedestrians in the urban areas are cited as being among the urban issues addressed in the Draft Kuala Lumpur Structure Plan (DBKL, 2003). Therefore, creating a user-friendly urban commercial street is one of the issues that are of most concern in respect of the Kuala Lumpur town centre. Interviews with the Kuala Lumpur city planners and officials at DBKL indicate that user-friendly streets are a concern in respect of Kuala Lumpur.

Urbanisation has developed rapidly during the last two decades. The drastic urban growth in tropical cities in recent years, including those in Malaysia, highlight the critical need for creating more outdoor spaces for leisure and recreation activities for the city citizens (Makaremi et al., 2012). Presently, Malaysia is undergoing rapid growth and is experiencing vast metamorphosis in most of the towns and cities. The rate of urbanization increased from 54.3% to 65.4% between 1991 to 2000, and, according to JBPD (2006), urbanization is expected to increase to 75% by 2020 with the majority of the population being urbanized (Jusoh et al., 2008). The process of urbanization has led to unprecedented growth in the population and erodes the urban qualities and character of the urban areas (Shamsuddin, 2011). Urbanisation has a tremendous influence on urban spaces. One of the influences is the erosion of the street as a public space, which also has an effect on public life and urban users (Sulaiman et al., 2001; Shamsuddin et al., 2010).

The rapid growth and construction in the cities have a tremendous influence on the relationship between the urban users and the streets and also between the residents/users and the social spaces (Sulaiman et al., 2001). The rapid urban development has also contributed to the degradation of the environmental quality, such as water, air and noise, which makes it unfriendly to users of the streets and urban space (Jusoh et al., 2008).

The increasing population in the Kuala Lumpur city centre every year has a major influence on demand on urban open spaces in urban areas (Bavani. M, The Star, 2008), and, consequently, community spaces have been lost in the urbanisation process due to many urban areas being developed into housing/residential in order to accommodate the increasing population in the city centre (Lim. G, NST, 2011). Therefore, streets have become the most public space in the city. This issue constitutes one of the most important concerns of the Draft Kuala Lumpur City Plan 2020. According to JBPD (2006), the increase in population has contributed to the decrease in the quality of the urban environment and the quality of life of the inhabitants, particularly in major cities. The increasing population in the city centre has come under criticism from the Kuala Lumpur residents in respect of the part that envisions a population increase from 1.6 million today to 2.2 million by 2020. This means that Kuala Lumpur City Hall (DBKL) would be forced to make controversial compromises, such as intensifying development and sacrificing open spaces, to accommodate another 600,000 residents in Kuala Lumpur within 12 years. Therefore, the streets will become a vital space for the public and need to be governed effectively and efficiently to promote an environment that is conducive, sustainable and friendly to all.

As the population increases, the number of elderly and people with disabilities will also increase. By 2020, it is estimated that the elderly will make up 7.5% of the total population (Yaakub et al., 2009). These figures must be interpreted as a need to create a better quality of the urban environment for all users to accommodate future needs in anticipation of further demographic changes in the country. *'Kuala Lumpur is a city that houses a population of 2.2 million and provides employment to 1.4 million people. The city will, thus, ensure that whatever it plans, builds or develops are what the people want and need. As a city that responds to the changing needs of the city, it will be 'inclusive'; where it enables people to participate fully in Kuala Lumpur city life, where social inclusion and liveability are important elements of this city' (KL City Plan 2020,p. 2.15).*

The rapid growth in the urban area has also led to an increase in the number of vehicles on the street. One of the dilemmas in the Malaysian townscape today is that the streets are overrun by vehicles and unfriendly to pedestrians (Shamsuddin et al., 2001). The effect of rapid urbanisation in Kuala Lumpur city centre has compromised the priorities of pedestrians in the city centre to the dependence on both private and public vehicular transportation (Shamsuddin et al., 2010). As vehicular traffic has greater freedom of movement, and people depend too much on cars, designers have assumed that the movement of vehicular traffic is a primary concern of urban planning. As a result, streets

have been widened for cars and market places have been converted to car parks (Dolbani, 2000); the entire existing street network has been destroyed by the notion that fast traffic takes priority (Shamsuddin et al., 2001). The result of the increase in vehicles on the street causes degradation of the environmental quality, especially air pollution due to emissions from motor vehicles.

Another significant issue in urban design that concerns most Malaysian towns and cities is the lack of consideration of human needs contextually (the setting of activities). Sulaiman (2000) found that one of the reasons for the poor quality of urban spaces in Malaysia is the limited appreciation of the context and the people. He argued that most new urban development, especially of public open spaces in the CBD area that have been taking place in major Malaysian towns, only reflect the political and architectural concerns without investigation or consideration of the behaviour and activities of the users (Sulaiman, 2000). Hence, Mijan (2000) contended that Malaysian planners and urban designers have failed to provide a broader range of activities or a user-friendly environment that is appropriate for the climatic, physical social and economic circumstances of Malaysian cities. In a multiracial, multicultural and multi religious society, like Malaysia, the city must fulfil the important role of maintaining racial harmony and unity (Wan Abdullah, 2007). Ujang (2008) stated that it will be beneficial to investigate the place attachment of particular groups of users (e.g., women, street vendors and Malays) in order to identify the needs of particular groups of users and how they perceive urban places and their reason for attachment. The form and degree of attachment provide an indicator of the significance of a place to the immediate users (Ujang, 2008), and any decision to improve the area should take into account the dominant function of the place as perceived by users and proven by the way they are attached in their activities. Abdul Latip (2011) stressed in her PhD research in Malaysia, there are still problems concerning the inclusion of the users in decision making, and, therefore, extra measures have to be taken in order to better understand the needs of all users in a specific context.

In Malaysia, the appropriateness of the design of urban commercial streets has been given little attention (Wan Abdullah, 2007). The existing trend of design in Malaysia mainly focuses on the design of individual buildings and little attention is given to the design of outdoor spaces (Sulaiman, 2000). As a result, the spaces between buildings in most Malaysian cities, such as roads, streets and paths are not suitable for pedestrians or other activities that previously took place in those spaces (Sulaiman, 2000). According to Talha (2008), a town planner, we cannot allow the cities to grow without human interference; she added that cities need to be redesigned to meet these changes in order

for them to reach sustainable limits. The absence of adequate or appropriate design for pedestrians makes the walking environment increasingly unfriendly for them. The rampant development caused the emergence of different living conditions, unorganized space organization, and, inevitably, the city centres lost their traditional character and failed to serve their primary goal as a place for living, thereby creating unfit urban public spaces that are unable to fulfil the local needs and aspirations (Mijan, 2000).

In respect of the aforementioned issues that contribute to the unfriendly urban commercial street environment in the city centre of Kuala Lumpur, and which have caused a decline in the quality of living for urban dwellers by creating an unliveable environment with no identity and degradation of the environmental quality, the Department of Town and Country Planning Peninsula Malaysia has set a target for creating a sustainable and safe environment that provides economic benefits to local residents as its main priority under the 10th Malaysia Plan. Therefore, the development and management of urban centres is one of the major challenges of time as well as one of the most complex tasks of society. The concentration of development and human activities in cities and towns has enormous implications for the urban population who find the urban environment physically, psychologically and socially taxing.

The National Physical Plan (2005) states that 'A major issue for the Kuala Lumpur conurbation given the projected population, is the need for further in-depth studies to address the need for urban dwellers in view of environmental aspects, implications on the quality of life for the conurbation residents and providing for infill and redevelopment of areas within the conurbation'. According to Dato' Seri Abdullah bin Hj Ahmad Badawi (NUP, 2006 p. 3) a township must be able to provide a good and competitive environment, complimented with all forms of activities within its territory. Ujang (2008) argued that an understanding of how the local people are attached to places is important in sustaining the sense of place; she also stated that the lack of attention in terms of the psychological aspects of place have resulted in less emphasis on the need to secure place meanings and attachment.

In the case of urban commercial streets, the issues concerning pedestrian walkways and pavements being occupied by traders setting up their stalls and creating an obstruction to the pedestrians is always highlighted by particular Asian Authors (Kher, 2003; Yatmo, 2008 and others). This condition forces pedestrians to step off the sidewalk and corridors as the stalls completely block the walkways. This situation is exacerbated in preparation for major festivals in Malaysia, such as Eid (one of the Muslim celebrations) and

Deepavali (one of the Hindu celebrations). This issue was highlighted in the New Straits Times on 15 October 2011 where the writer stressed that *'Guidelines should be set for the traders before they are issued with permits and enforcement must be carried out to ensure that traders are not obstructing walkways, especially those with disabled friendly facilities'* (Lim, NST, 2011, p 2).

According to the National Urbanisation Policies (NUP 2006-2020- p.21), another issue in urban areas is the decline in the quality of living for urban dwellers. In terms of social facilities, it has been found that the provision of recreational areas is generally inadequate for all towns in Malaysia. Moreover, there is a problem concerning the maintenance of facilities as well as being non user-friendly since the location and design of facilities do not take into account the needs of certain segments of society, such as the disabled, children and the elderly. Malaysian towns have also experienced a decline in the quality of living with respect to safety. Kuala Lumpur City Plan (2020) states several main issues have been considered in respect of the needs of the people to create a world-class city. These include promoting quality living, a liveable city that is safe and walkable, with improved living standards including a conducive physical environment, together with a quality urban environment and inner city living with community facilities that are accessible to the public. The Malaysian Quality of Life Report (2004) indicated that between 1990 and 2002, the public safety index declined by 19.9 points. On average, the percentage of crimes increased from 3.8 cases in 1990 to 6.2 cases in 2002 pp.23. According to Dato' Seri Ong Ka Ting (NUP 2006 p 4) 'towns need to be governed efficiently and effectively to promote a sustainable and conducive environment as a place of work and living'. The NUP (2006) Thrust 5 concerns the creation of a conducive and liveable urban environment with identity is primarily concerned with a comfortable, user friendly living environment with facilities for social interaction, in addition to creating a sense of belonging for its population. This thrust emphasizes that peaceful urban living should be equally enjoyed by all urban residents so as to achieve the goal of improving solidarity. In conjunction with this issue, under part of the safe city concept in respect of the Federal Government's National Key Result Areas, a few initiatives have been taken to prevent the public from contributing to street crime statistics (Murty et al., 2011). One of the initiatives is to separate the pedestrian walkways from motorists by hedges, plants and bollards to prevent the rising number of snatch thefts in the city centre, which contribute to the status of an unfriendly environment to the public users (Murty et al., 2011).

As the population increases, the urban centres should be planned and managed as a more attractive place for living, working and recreation. In the Government's Economic Transformation Programme (ETP), one of the objectives is to create a conducive environment to improve the quality of life (GTP, 2010). This is to accommodate 67% of the population in Malaysia that live in the city centre (GTP, 2010). In addition, under the National Urbanisation Policies (NUP 22), adequate, fully equipped and user-friendly public amenities shall be provided with continuous management and maintenance. The measures for this NUP are to provide user friendly public amenities at accessible locations, provide high quality public amenities, improve access to public amenities through a continuous and adequate pedestrian network and bicycle lanes that are safe, comfortable and user-friendly (NUP, 2006).

The development of urban areas shall take into consideration the Malaysian identity, which is multi-racial. The interests of none of the races will be neglected or obstructed (NUP 14). Therefore, under NUP 9, it is stated that open space and recreational areas shall be adequately provided to meet the requirements of the population. "The goal of urban development is to create a liveable environment that could realize a peaceful community and living environment require a balance in all aspects of development, namely, physical, economic, social and environment" (NUP, 2006). It was also stated in NUP 22 and NUP 26 that people should be encouraged to walk and that improvements to the quality of life and reduction of urban heat island effects in the city centre are sustainable (NUP, 2006). There is also support for needs, such as pedestrian spaces in both linear and pocket form for pedestrians gathering and to identify the factors that can increase human interest in using pedestrian walkways (Kher, 2003).

Most of the contemporary design and planning in cities in Malaysia have been criticized for their inhumanity and insufficient amenities to meet the movement purposes of urban users (Yaakub, 2006; and Yaakub et al., 2009). It seems that to satisfy the need of vehicular flows has become the dominant idea adopted by our planners and designers. The study of users' needs in urban commercial streets is important in order to identify the impact of globalization and standardization that threatens the cities, including whether or not the people enjoy these streets, and, accordingly, what concerns them in this respect? In fact, some urban commercial streets are very popular while some are neither as busy nor as popular with people as the designers envisaged. Sometimes Western design influences have introduced new ideas, which sometimes have been incorporated in inappropriate ways, or at unsuitable scales. Therefore, it is a good starting point to discover the reasons behind such phenomena (Tang, 2002).

Places can be created if we respond to the climate and the local people's behavioural characteristics and needs in the design (Shamsuddin, 2009). 'Creating streets for people' – the move towards 'people priority'– is emphasized in the Kuala Lumpur City Plan 2020, in which the priority for the use of road space must now take into consideration the people's safety and comfort in travel (KL City Plan 2020 p 5.14). Kuala Lumpur City Image (JBPD, 2002) integrates three principles embodying the concept of a fundamental relationship between man and his creator, man and his fellow men, and man and the environment while, at the same time, incorporating seven concepts in shaping the image of the city (peaceful, friendly, smart, beautiful, active, prosperous and multicultural). The quality of life for the citizens of Malaysian cities, such as living, working, playing, learning, healing and relaxing can be greatly enhanced by spatial design (Lim, 2011).

1.2 Research agenda

1.2.1 Research questions

This research revolves around three research questions and issues. The key research question is **'why are most urban commercial streets in Malaysian city centre not friendly to their users?'**

The subsidiary questions are:

a) What are the reasons and attributes that make a street friendly to the users?
b) What are the differences and similarities of a friendly street to people from different socio-demographic backgrounds?

1.2.2. Research aim

The aim of this research is to identify the elements and factors that make urban commercial streets in Malaysia city centre friendly to all users.

1.2.3 Research Objectives

The main objectives of the study are:

a) To identify the reasons that make a street user-friendly.
b) To examine the attributes of the street that make a street friendly to users.
c) To determine the similarities and differences of a friendly street to people from different socio-demographic backgrounds.

1.2.4 Research Assumption

The design of urban commercial streets in Malaysian cities is not friendly to the users because the needs of the user in respect of the physical, functional and social qualities are not met.

1.3 Scope of the Research

Most studies concerning user-friendliness focused on open space in general and not specifically on urban commercial streets. Hence, the majority of the studies are conducted in different contexts, mostly in Western countries with a lack of studies in the local context. The studies pertaining to streets were more from a governance approach and did not address the users view and needs. In this research, the study focuses on one type of space the shopping streets within the commercial district in the city centre of Kuala Lumpur.

The reason for choosing streets is that, in Malaysia, squares do not play an important role in the planning and design of urban areas compared to streets (Sulaiman, 2000). Hence, the study will only look at the shopping districts because they relate strongly to public spaces and public activities, which is one of the major concerns of urban design (Ujang, 2008). Jacobs (1992), Gehl (2010) and other scholars argued that successful urban places are predominantly based on street life and the various ways in which activities take place. Therefore, the boundary of the study is the space between two rows of buildings or street concentrating on the pedestrian level (ground floor level) as it has a more significant contribution to the friendliness of the streets; as Bentley (1985) noted, it contributes to the vitality of the street. The chosen place for study of this problem is Jalan Tuanku Abdul Rahman, which is one of the urban commercial streets in Kuala Lumpur's city centre (Abdallah et al., 2008). This is an illustrative case study, the results of which are applicable to urban commercial streets in Malaysia or other commercial streets that have similar characteristics with the street studied.

This thesis focused on street users rather than the perceptions of professionals. This is because, according to Sulaiman (2000), one of the reasons for the poor quality of urban spaces in Malaysia is the limited appreciation of the context and the people, and, furthermore, the understanding of the relationship between the people and environment is essential in urban design (Carmona et al., 2003). According to Lynch (1960), if cities are to be used by different major groups, studies must be done to discover the similarities

and differences in terms of the perception between the groups of their urban environment. The main concern in this research is to study the needs of the urban users in open spaces and their relationship with the built environment and their functional qualities in the Malaysian urban context. Although the social qualities are important in respect of components that relate to friendly streets, the components were not fully explored individually in this research. This is seen as a limitation concerning the research findings.

This research was limited to four important aspects of an urban commercial street, which are outlined as follows:

a) The physical and functional quality of the streets
b) The cultural, gender, ethnic, socio-demographic and life cycle stages of the users
c) The key uses and activities
d) Users

Since the study is in the context of environmental design, the components and attributes associated with the criteria that contribute to user-friendly streets are varied, and are based on the different principles and approaches applied by different authors. Here, in this research, the discussion is limited to the components and attributes of the place that are strongly significant to urban street design and local issues. The key criteria are accessibility, usability, safety and security, comfort and convenience, and liveability.

1.4 Structure of the Thesis

The thesis consists of eight chapters, the structure of which is described below:

Chapter 1 – presents the overall structure of the research. This chapter describes the background of the study, the issues, research questions and research objectives, research assumption and research aim, scope and limitations of the research, and introduces the methodology for the research. Finally, this chapter highlights the significance of the research and its contribution to knowledge.

Chapter 2 – presents a review of the literature relating to the research topic. It establish the concept of a 'user-friendly urban commercial street', as well as the general theories concerning good street design, responsive environments and sustainable urban design in order to define the theoretical foundation and scope of the research.

Chapter 3 – presents a review of the parameter and criteria for user-friendly streets and the current body of knowledge concerning the main attributes that determine a user-friendly urban commercial street.

Chapter 4 – explains the methodology and procedure adopted to assess and measure a user-friendly street. It discusses the approach of the methodology, the scope of research, the process that determines an appropriate research design and the way the investigation is structured.

Chapter 5 – presents an introduction to the area of study. The analysis includes the social and physical contexts, the urban design policies associated with the context, the physical characteristics, the users, the uses and activities as well as changes and improvement of the places.

Chapter 6 – examines the perceptions of the town users in respect of the quality of the physical and social environment. This chapter also analyses the data concerning the attributes and characteristics of a street that strongly influence a friendly street. It is based on the identification and perception of the significant attributes by the respondents. This chapter also presents the discussion on the main findings of the research in relation to the research objectives.

Chapter 7 – presents the findings on the analysis of data associated with the third objective of the research. It also determines the similarities and differences of a friendly street to people from different socio-demographic backgrounds.

Chapter 8 – presents the planning urban design implications of the findings and contribution of the findings to urban design theory and practice. Recommendations for urban design practice are made in respect of user-friendly street dimensions that are appropriate for the selected context. Finally, a conclusion to the research is drawn, and its broader applicability and suggestions are made for possible further research in this area.

Structure of the thesis

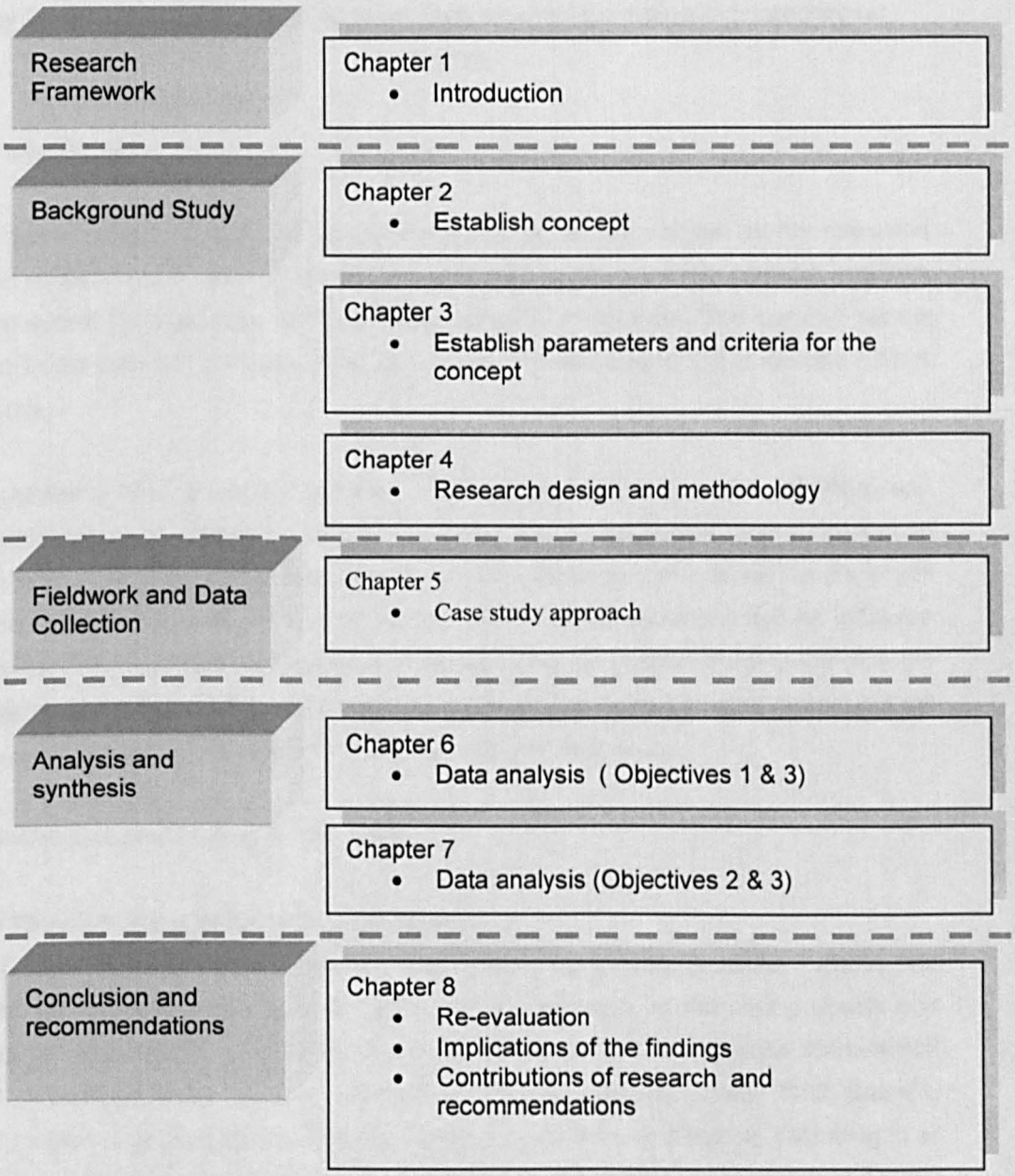


Figure 1.2: Structure of the thesis

CHAPTER TWO

THEORIES, CONCEPTS AND HUMAN DIMENSIONS OF URBAN COMMERCIAL STREETS

2.0 Introduction

This chapter discusses the concepts and theories of streets, as well as the roles and human dimensions of urban streets in order to define the focus of the research and form the theoretical framework for conducting this research in Malaysia. The literature review assists in the selection of respondents and choice of methodology that is relevant for this research.

This chapter is divided into five sections. The first section discusses the definitions and concepts of a street. The second section explains the role and functions of a street in an urban area. The third section discusses the human dimension of a street; user's needs and activities in the street. The fourth section discusses the social and cultural influence of streets. The last section presents the conclusions for this chapter which summarize the definitions and concepts of a street; role and functions of a street in urban areas; human dimensions of a street and social and cultural influence of streets.

2.1 Definitions and concepts of a street

2.1.1 The concept of space and urban space

Towns and cities consist of buildings and intervening spaces (Sulaiman, 2000) and streets are one of the elements of urban space. Therefore, in discussing streets one needs to understand the concept of space. Space is one of society's fundamental material dimensions with a variety of functions and activities (Sulaiman, 2000; Castells, 2003); space is defined as a boundless, continuous expanse or distance, extending in all directions, and in which all material things are contained. A place furthermore is defined as a specific and recognizable part of space, and a part that bears a meaning for someone (Gertrud, 1992).

In this research, 'the street', is defined as one of the elements in the urban space. Urban space is the space between buildings, space that is defined by buildings, bounded by a variety of elevations and not contained by buildings (Oktay, 1990; Krier, 1979; Sulaiman, 2000). Urban spaces vary in shape and size due to the modulating factors of angling,

segmentation, addition, merging, overlapping and distortion of elements (Krier, 1979). It comprises two main elements: streets (roads, paths, alleyway, avenues, lanes, boulevards, etc.) and squares (plazas, piazzas, courts, places, etc.) (Krier, 2003; Moughtin, 1992; Carmona et al., 2003; Tonkiss, 2005). However, Dixon (1999) adds that instead of streets and squares, covered shopping arcades and galleries, atriums in hotels and office buildings within a town are also elements of urban space. In an urban area, a good link between architectural space and urban space is needed to create continuity between buildings and these two elements (streets and squares) (Oktay (1990). Hence, the way urban street blocks are organised in urban areas do affects the quality of built environments and the character of urban townscape (Shamsuddin, 2011).

In this research, the study only focuses on street. This is because the main characteristics of this space are accessibility and usability for all people (Nissen, 2008). The street is a space for communal use, a place where we share the social aspects of life in the city (Tonkiss, 2005). Streets are the main public space in urban areas. According to Jacobs (1996), when we think of a city, the first that comes to our mind is streets. This is because streets in urban areas comprise 25% to 35% of all developed land (Jacobs, 1996) and it is estimated that 80 per cent of public space in urban areas nowadays is in the form of streets (Woolley, 2003). In Malaysia, squares do not play a vital role in the planning and design of urban areas compared to streets (Shamsuddin, 1997; Sulaiman, 2000). The 'padang' is the most important public space that is closely associated with the squares (Shamsuddin, 2012). Streets also serve a more functional purpose than other urban spaces and most of the people in urban areas live on streets and regularly pass through them in their everyday life (Shamsuddin, 1997). Therefore, this research focuses on urban commercial streets in a Malaysian town centre. The following section explains the definitions of a street.

2.1.2 Definitions of street

A street is a public space that has been subjected to studies in the design of the environment (Lynch, 1960; Moughtin, 1992; Krier, 2003). The definitions of street vary based on the scope and the research perspectives. According to Jacobs (1961), before giving a suitable definition of a street, the sociological character and physical elements that form the street have to be understood first. A street is a public road in the city, town or village with houses or buildings on each side (Shamsuddin et al., 2004). The main distinction between a road and a street are that a road is an ordinary line of communication between different places, travellers on foot or vehicles and a street is an

enclosed, three-dimensional space between two lines of adjacent buildings (Moughtin, 1992). Streets, according to Carmona et al. (2003), are linear three-dimensional spaces enclosed on opposite sides by buildings that may or may not contain roads. In Lynch's term, a street is a path enlivened by a series of nodes where other paths meet it or where activities intensity to such an extent that places and rest for dominance with function of pathway and movement (Shamsuddin et al, 2004). Streets are dynamic spaces with a sense of movement and are the product of spread settlement (Krier, 1979; Carmona et al., 2003). ITE (2006, p.49) provide a very clear functional definition of a street. 'A *street is a walkable, low speed (25mph) in urban areas primarily serving abutting property. A street is to connect neighbourhoods with commercial and other districts, and connect local streets to arterials'.*

In the case of urban design, the street is one of the main actors instead of the square and the buildings in making the face of cities. In Moughtin (1992), the meaning and role these elements play in urban design, the way in which they are arranged, designed and detailed are essential subjects. Carmona et al.(2003) noted that streets can be characterised as formal, which typically have a strong sense of enclosure by orderly pavement pattern, arrangement of street furniture, or surrounding buildings to enhance the formality, and usually symmetrical layout, or informal, which typically have a more relaxed character and an asymmetric layout.

Instead of the formal and informal quality, street form can also be analysed in terms of polar qualities (straight or curved, short or long, wide or narrow, enclosed or open), in terms of scale, proportion, contrast, rhythm or connection to other streets and squares. Street has two main characteristics directly related to form- place and path (Moughtin, 1992). Streets can vary in length, cross-section, shape, character, function and meaning. Streets are defined in two ways: vertically, which has to do with the height of buildings or walls or trees; and horizontally, which has most to do with the length of and spacing between the buildings or walls or trees that doing the defining. There are two quite distinct physical conceptions of a European city. In the first conception, it appears that the streets are carved from an original block of solid material. Another conception of a city is that of the form of open parkland into which buildings have been introduced as three dimensional objects sitting on and within the landscape (formulated by Le Corbusier and others in the modern movement of architecture) (Moughtin, 1992).

2.1.3 Type of street

Based on previous scholars, there are three types of street generally recognizable: Minor or local, collector and arterial (Moughtin, 1992; La Plante, 2007). City streets are designated as arterials, collectors or minor/local depending on their place in that area's functional classification system (La Plante, 2007). A local or minor street carries traffic from collector streets to the individual land parcel within any given area where the primary function is to provide access to other properties. The collector street is to connect residential areas to community centre areas. A collector street has typically 7-12 meter width and has three to four lane roads (Moughtin, 1992). Commercial uses usually occur at the intersection of arterials and collectors. Arterial streets are by definition intended to primarily with emphasise operating speed and traffic carrying capacity between nodes with commercial or industrial functions (Moughtin, 1992, La Plante, 2007). Arterial streets have right of way widths of 12 meters and larger. They are designed for the movement of high volumes of traffic between nodes with commercial or industrial functions. Generally, no dwellings front directly onto arterial streets (Moughtin, 1992).

Alternatively, Rykwert in Abdallah (2008) classified three different types of street: street related with path, especially for pedestrians (path, track, promenade or mall); street that exists physically because of the context (terrace, row, arcade and gallery display); and street that was used by American and European town streets principally, the long street, which was a development area such as the 'main street' or high street'. High streets are usually wide, busy with traffic and pedestrians, and lined by buildings of at least two to three storeys in height with shops on the ground floor and offices or flats on the upper floors (Burton et al., 2006).

However, in Shamsuddin et al. (2004) streets are classified into nine types: public street, streets in the area of public institutions such as schools, hospitals, government buildings and others (Shamsuddin et al. 2002); commercial street , which includes 'high street' and streets in the business area or commercial buildings area; housing street, which is the street in the housing area where privacy is the main priority (Davies,2000); pedestrian street, which is a street only for pedestrians and is an interactive space and segregated from vehicular traffic (Shamsuddinn et al, 2002); combination of residential and commercial street, which has two functions - residential and commercial; industrial street, which is a wide street that caters for trucks and trailers and is designed for heavy duty use (Denver in Shamsuddin et al., (2004)); landmark street, which include those streets that have unique characteristics in respect of the history, architecture and geography of

an area; and main street, which is based on the typology urban form in Malaysia, the urban settlements start with a street that is normally called 'the main street' (Shamsuddin et al, 2002). The main streets are designed to encourage walking activities, cycling and transit activities with an interesting landscape (Davies, 2000). According to Shamsuddin et al. (2004), this street acts as a circulation route to connect areas from suburban and urban areas and their surroundings. The last street type is the avenue or boulevard, which it is a formal street with street planting elements Shamsuddin et al., (2004). According to Cliff Moughtin and other British urban design theorists in Sulaiman et al. (2002), urban streets in European and most North American cities can be grouped into three functional types: the first type is the great civic streets nominated by public institutions, second is commercial streets with their commercial establishments and the third are residential streets. However, in Malaysia, Sulaiman et al. (2002) did add one more type of street, which contains both commercial and residential activities with the shops at the ground level and the living areas at the upper levels.

In Malaysia, the character of the street varies according to the purpose and function of the location, physical form and appearance, socio-economic and cultural characteristics of the user as well as the habitants. This may affect the needs and perceptions of the users that might be different from other street users in other countries. A typology study of urban form of three old Malaysian towns by Shamsuddin et al. (2002) established that the urban settlements began with streets (usually called 'Main Street'). The streets are normally flanked by rows of pre-world war II 'shophouses' designed with a continuous public way, known as the 'five-foot walkway' or veranda (Yeang, 1986) and segregated from traffic and significantly used as a pedestrian route and extended space for the shop activities. This research focuses on this type of street which is urban commercial street. The urban commercial street is a place that strongly influences the character of the city centre and functional significance of the life of the street users. Therefore, research on a user-friendly urban commercial street is important in enhancing the uses and creating a liveable environment for the users that fulfils their needs.

2.2 Role of street in urban cities

Streets are places of significance in many aspects (Ujang, 2008). The knowledge of role of street is important in order to study user-friendly street because it will affect the people uses and activities on street (Whyte,1980 and Carr et al, 1992). Urban scholars come out with many functions for streets in an urban environment; however, most of them focus upon two aspects of a street, its visual form and function. Allan Jacobs said, '*streets are*

what constitute the outside for many urbanites; places to be when they are not indoors...' (Jacobs, 1996,p.4). Streets can have varying functions. Streets are much more functional in their character compared to squares and play an important role in shaping the quality and character of urban living (Krier, 2003). Therefore, streets are the most important part of towns and cities and are where the greatest amount of human contact and interaction take place (Tibbalds, 1992).

Street should not to be seen just as a circulation channel, but also as an important theatre-like setting upon with people's perception of the city is made. Therefore a street is different from a road where it must have a spatial atmosphere appropriate to its function and the perception of the community (Moughtin, 2003). Based on reviews, streets have been created and used for multi purposes such as playgrounds, places to exchange commodities and venues for political demonstrations (Madanipour 1996; Banarjee 2001; Carmona et al., 2003; Van Melik et al., 2007). Streets are venues for special events, shopping, and pavement cafes (Van Melik et al., 2007).Traditionally, the urban street has united three physical roles: circulation route, public space and a built frontage (Marshall, 2004). Meanwhile, according to Gehl (2007), streets play three main functions: meeting places, market place and connection space. Streets accommodate activity- business and social activities (ITE, 2006). Hence, they have teamed with people and functions throughout history and life in city space was an essential part of society as activities in the urban design shape the urban space (Madanipour, 1996; Gehl, 2007). From the literature review we can summarize that the streets have three main functions namely; access (circulation route or connection space), social space and market place.

The primary function of streets is to provide access to abutting properties (Appleyard, 1983; Moughtin, 1992). The success of pedestrian areas is dependent on the variety of the attractions they offer so that pedestrians in large numbers have a reason for remaining and also good access from both private and public transport (Moughtin, 1992). As a link it facilitates the movement of people as pedestrians or within vehicles and also the movement of goods to sustain a wider market and some particular uses within the city (Moughtin, 1992). The street provides a link between buildings, both within the street and in the city at large. Hence, for legible streets it also act as guidebooks to the city that can tell visitors and commuters where things are, what the city is about. Appleyard (1981) noted that in order to be a good city, the streets should provide the urban users with access to necessary facilities such as to jobs, public services, amenities and recreation places. As well as providing access, streets are also the entrances and arteries of a city (Appleyard, 1981). Streets also form a boundary that brings order to a city. The streets

and the blocks act as the starting points (Jacobs, 1996). Worpole (1992) also saw the unique importance of streets to urban life when he argued that other than act as for the passage of traffic, street also perform other vital functions such as give access to buildings, they give light and air, they are the setting for architecture. Hence he adds that the streets are the backbone of the everyday surroundings for many people.

Streets not only act as access routes but also as important arena for social expression (Moughtin, 1992). They must contain both social space and movement space (Jacobs, 1996; Carmona et al. 2003); however, most of the streets in Malaysia only contain movement space and lacking of social space. The street according to according to Jacobs is always the floor and more than public utilities, more than linear physical spaces that permit people and goods to get from home to there (Jacobs, 1996). Communication remains a vital aim of streets, where in the latter half of the twentieth-century it attracted considerable attention (Jacobs, 1996). The people of cities understand the symbolic, ceremonial, social and political roles of streets, not just those of movement and access (Moughtin, 1992). Streets are the place of social encounter for people to interact and socialize that contain outdoor public life (Appleyard, 1983); places of pleasure and anxiety; shop and recreational activities and also political protest (Malone, 2002; Dumbaugh, 2005).

Tibbalds (1992) noted that the public realm such as the street is the most important part of towns and cities where the greatest amount of human contact and interaction take place. Based on reviews, public spaces have been created and used for multi purposes such as playgrounds, places to exchange commodities and venues for political demonstrations (Madanipour 1999; Banarjee 2001; Carmona et al., 2003) in Van Melik et al. (2007). Jane Jacobs (1961, p.37) argued that, *"streets and their sidewalks, the main public places of a city, are the most vital organs. .....If a city's streets look interesting, the city looks interesting; if they look dull, the city looks dull".* Southworth (2002) describes streets as the agglomeration of people, objects and events, in which the most important form of social infrastructure in urban settlements, particularly in the lives of poorer people, whose housing is often too small for household needs. The spaces also accommodate the informal and formal events that are central to the process of urban living (Payne, 2005).

The presence of people and activities on the street affect the liveability of the city (Appleyard, 1981). Therefore, a well-designed roadside, is important to the street as a 'public place'. Appleyard (1981) saw the street as the most essential space for life. He

envisioned several positive roles: the street as a sanctuary ('pedestrian territory'), a liveable environment, a community, a neighbourly territory, a place for play and learning, a green and pleasant land and a unique historic place. Considering different user groups and splitting the criteria into 'on-system'(internal to people in traffic) and 'off-system' (caused by people in traffic to others) criteria, he suggested items, such as safety, comfort, convenience, awareness, privacy, control, services, responsiveness and many more (Vasconcellos, 2004). Jacobs (1961) and Whyte (1980) in Lang (1994) noted that providing spaces that are not used, however, does cities considerable psychological harm.

However, all the functions are referred to the general type of streets all over context and not specifically to the urban commercial street in Malaysia city centre context. In the case of Malaysia, based on previous research on commercial streets in Kuala Lumpur, it has been indicated that activity is the most influential quality that attracts visitors and shoppers to the streets (Ujang, 2008). In Malaysia, streets are regarded as a geographical location as well as socio cultural enclave (Ujang, 2008). According to Shamsuddin et al. (2004), the shopping streets in Kuala Lumpur city centre are identified and characterised by name, location, the people or users who mostly use and occupy the street, the users' cultural background, and the main uses and activities held in the area.

Streets have a three-dimensional physical form, which, while it may not determine social structure, does inhibit certain activities and makes others possible. Streets are used as a site for casual interaction, including recreation, conservation and entertainment, as well as a site for ritual observances (Jacobs, 1996; Moughtin, 2003). In summary, streets not only act as a path from the point of origin to a destination as usual people think but are the actual places that we use and participate in communal life. As Appleyard (1983) stressed, the main streets of Third World Cities must be thought of as community and cultural centres, not merely as traffic ways to pass through on the way to somewhere else.

Some streets provide an exchange of services or goods, places to do business or political space (Moughtin, 1992). Streets are venues for special events, shopping, and pavement cafes (Van Melik et al., (2007)). Streets are places for social and commercial encounter and exchange (Jacobs, 1996). However, the fact that streets impinge upon urban life as routes, location of services, frontages to both residential and business properties and the boundary between public and private life is often ignored by professionals, politicians and decision makers (Institute of Civil Engineers, 2000) in (Woolley, 2003). Therefore, the understanding of the roles of streets in a specific context

is important so that it can cater to the needs of the users in a specific place. In Malaysia, the role of streets might be different due to different economic levels, culture, climate, politics and way of life compared to other countries, especially those in European and Western countries. As Sulaiman et al. (2011) argued, streets should be a setting for pedestrian activities that reflect local culture and climate.

2.3 Human dimensions and streets

The role of human aspects is established as an important framework for a user-friendly street. Human beings are the most moveable objects that need a variety of outdoor activities including trade, recreation and urban life in the street (Cullen, 1961). Therefore, the good or bad of the street can be judged by the people who use and are involved with the street. Nowadays, the human dimension has been overlooked and not seriously addressed in urban design compared to other issues, such as accommodating the increase of cars in urban areas (Gehl, 2010).

Rapoport (1986) stressed that many designers believed that they knew what the user's need in space was but they did not because there was no research. He added, *"there is thus a great need for man-environment relations research"* (Rapoport, 1986, p.173). He also suggested that designers must get away from the normative approach in which the space must be used in such and such away and need to approach the problem differently according to the desire of the users and that things should be done to achieve supportive characteristics of these desired uses and activities. Human physiological needs are the main aspect that designers have to consider in the design of the urban public space. As Lang (1994) argued, in order to meet the human physiological needs there are three major areas of concern: the activities, the qualities of the milieu to support those activities and the ambient condition in order to make those activities comfortable.

According to Jane Jacobs (1962), if the street is not designed for people, it will become a place that breeds crime due to the lack of human surveillance. This is supported by Whyte (1980, p.7*), 'collectively, a city's abundant small spaces have a major impact on the quality of life. If those space are unattractive, people will likely retreat from the city street, perhaps from the city itself...if we learn to take advantage of our small urban spaces, design new ones well and fix up the old ones, we will keep the streets alive. We may even encourage more people to use them, and to smile about it'.*

The rapidly increasing concentration of people in urban areas along with the focus to improve the quality of life, and revitalise city centres, has led to increased attention to the quality of open urban spaces (Forsyth, 2003). Carr et al. (1992) argued that from their research and ideas on public spaces, there are three critical human dimensions that are often neglected when public spaces are developed: needs, rights and meaning. Their ideas and research are centred on understanding the interaction of people and places and how this affects the ways, settings, or function. Places that do not meet people's needs or that serve no important functions for people will be underused and unsuccessful. The space that surrounds us and the objects enclosing that space may determine how far we can move, how warm and cold we are, how much we can see and hear, and with whom we can interact. It may heavily influence the mood we are in, and the way we feel towards the tasks we might have to perform and people we might find in our company. Therefore, we demand a great deal from this space. At one basic level we have specific needs for such things as adequate lighting and fresh air to breathe. We need to be able to reach furniture, equipment and other facilities to perform some tasks. At a rather higher level, we need space to help us to feel right about our current situation (Lawson, 2001).

Among those working in a developed country, Appleyard (1981) seems to be the first to use in a systematic way a role- conflict approach when analysing the use of streets by people. He had two main intellectual interests: first, the application of social science methods to address environmental issues, especially by taking the psychological approach in the beginning of his work, and the study of the streets themselves as places for living (Vasconcellos, 2004). Rivlin (1994), in his interviews and observation revealed that people often seek privacy in public places, they go to public places to be alone, to think about things, and sometimes to grieve. *'Public space is the stage upon which the drama of communal life unfolds. The streets of a city give form to go out and flow of human exchange. These dynamic spaces are an essential counterpart to the settled places and routines of work and home life, providing the channels of movement, the nodes of communication, and the common grounds for play and relaxation'* (Carr et al, 1995, p.3).

Many studies have been made of how people experience places, what constitutes a place and how identity is formed. Most of them are strictly concerned with the form of the environment –few have paid attention to the activities or urban uses and their contribution to place and identity. This is, therefore, an attempt to reflect on the relation between form and use in the construction of the identity of place (Gertrud, 1992). If urban design is to be in the public interest, the design guidelines and/or controls used to shape the property

development activities of individuals and organizations must meet public objectives (Lang, 1996). Jacobs (1961) and Whyte (1980) in Lang (1994) noted that providing spaces that are not used, however, does cities considerable psychological harm.

2.3.1 Human needs

In order to understand the human need in urban-commercial street, an understanding of basic human needs is important. Fulfilling the needs of human is one of the main criteria that contribute to the user-friendly street. Lang (1994) associate needs satisfaction with the driving force behind the people behaviour. Maslow (1968), in Carmona et al. (2003), identified a five-stage hierarchy of basic human needs there are: physiological needs-for harm and comfort; safety and security needs- to feel safe from harm; affiliation needs- to belong to a community; esteem needs- to feel valued by others; and self actualisation needs- for artistic expression and fulfilment. Carmona et al. (2003) suggested that the most basic physiological needs must be satisfied before progress can be made to the higher ones. However, according to Lang (1994), the hierarchy of needs are highly interrelated with each other. He also developed a framework of hierarchy of human needs and design concerns in order to achieve the needs (Figure 2.1).

In this research, the understanding of human dimensions, their uses and activities, their needs and preferences, how they interact and what makes them use the street are essential to identify what a user-friendly urban commercial street is to the users in the context of Malaysian cities. As per argued by Mijan (2000) that, most of the urban spaces in Malaysia city centres nowadays including commercial streets are frequently designed to support the needs and interests of corporate clients and do not contribute much to support the public usage. Therefore there is a general tendency that with fast pace of development especially in the city centre of Kuala Lumpur, there is a danger that the city will end up having streets including commercial streets which eventually are not friendly to the various users groups.

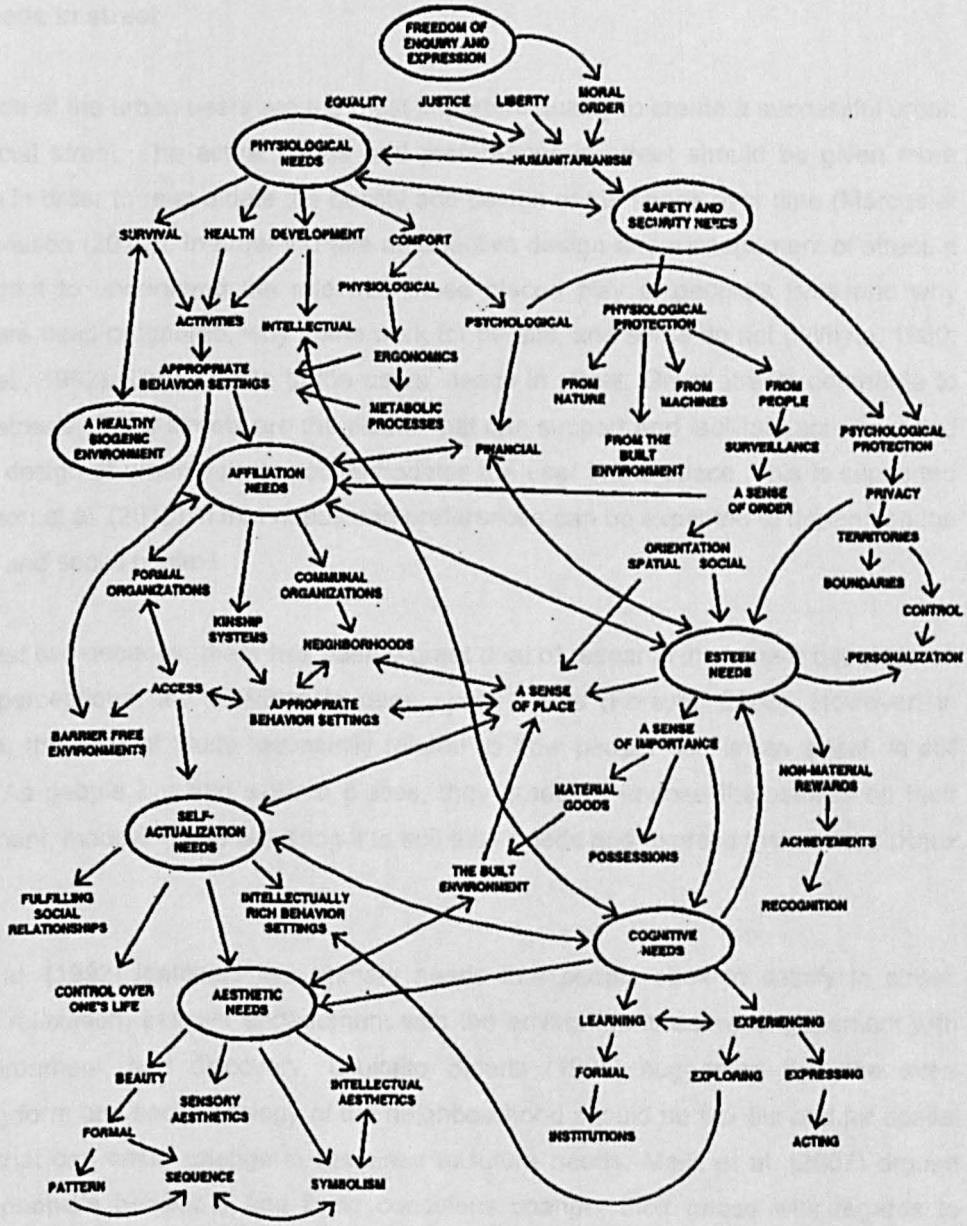


Figure 2.1: Hierarchy of human needs and design concerns

Source: Adapted from Lang (1994, p.157)

2.3.2 Needs in street

The needs of the urban users are the most important quality to create a successful urban commercial street. The actual needs and preferences in street should be given more attention in order to re-evaluate the quality and design of the space over time (Marcus et al., in Jansson (2010)). In order to have an effective design and management of street, it is important to understand the role that those places play in people's lives and why spaces are used or ignored; why some work for people, and some do not (Whyte, 1980; Carr et al., 1992). These relate to the users' needs in street. Great streets contribute to friendly streets. Great streets are the places that can support and facilitate activities; and how the design of urban streets accommodates the user in the space. This is supported by Jansson et al. (2010) in that needs and preferences can be expected to depend on the physical and social context.

In the past two decades, there has been a great deal of research in western countries on human perceptions and activities in open space areas (Forsyth, 2003). However, in Malaysia, this kind of study, especially related to how people use urban street, is still lacking. As people live and work in places, they gradually impose themselves on their environment, modifying and adjusting it to suit their needs and express their values (Knox, 2005).

Carr et al. (1992) identified five primary needs that people seek to satisfy in street: comfort, relaxation, passive engagement with the environment, active engagement with the environment, and discovery. Loukaito Sideris (1995) suggested that the ever-changing form and social ecology of the neighbourhood should be flexible and for spatial layouts that can easily change in response to future needs. Melik et al. (2007) argued that as people's behaviour and living conditions change, their needs with regards to street will also change. Carr et al (1992) noted that, since world war two, the amount of public space designed to meet the needs of an increasingly stratified and specialized public life has multiplied. The current needs of users are important to identify so that the planning and design of urban streets is based on the current needs of users. Sulaiman (2000), in his research, argued that public perception of environmental design and its contributions to the design process in the context of Malaysian practice are important, as it will have implications on the approach that designers use in their design process and will have a significant contribution to the methods adopted by the designers in the design approach.

Comfort is a basic need of people in urban space; it is one of the indicators of successful public spaces. According to (Carmona et al., 2003), the length of time that people spend in a public space depends on the function and the indicators of its comfort. Hence, without comfort it is difficult to perceive how other needs can be met (Carr et al., 1992). Another primary need in public space is relaxation. According to Carr et al. (1992), relaxation is prerequisite to comfort and it is a more developed state with body and mind at ease. Next is passive engagement. Passive engagement according to Woolley (2003) includes activities like watching other people, looking at views, reading, and resting or meeting friends. Passive engagement with the environment could lead to a sense of relaxation (Carr et al, 1992).

Unlike passive engagement, active engagement involves a more direct experience with the place and also people in the space (Carmona et al., 2003 and Carr et al., 1992). Discovery, according to Lynch (1960), is the reason for people's presence in public spaces and represents the desire for stimulation. Carmona et al. (2003) suggested that discovering involves a break of the normal and routine, it may require a 'sense of surprise' in the space. Lynch (1960) suggested that contrast and juxtaposition of elements can provide a sense of surprise that people like and enjoy. People like to move around the space and discover parts of the place. According to Carr et al. (1992), the major aspect is the diversity in the physical design and the views. Cullen (1961) added that the experience of discovery also contains a sense of mystery. The need for discovery is met by travel, going to new places to discover their special qualities, to meet new people, and to find new challenges from the landscape that contrast from the familiar ones (Carr et al., 1992).

Most of the needs in urban spaces identified in this literature review are mostly to suit the users in the different contexts of place, climate and culture. There is a lack of studies of theories of peoples' needs in urban spaces generally, and streets, particularly, by scholars in a similar context to Malaysia. Hence, most of the studies that relate to people's preferences and needs are mostly not specific to streets, especially a commercial street. The needs discussed in the literature generally concern the needs of users in other urban space typologies and not specifically in streets. The needs of users in Malaysian urban commercial streets might be different from the needs of other urban spaces, other type streets and other commercial streets in other places. This is supported by Tibbalds (1992) who argued that the main component in a successful urban design is the context.

2.3.3 Users' activities and behaviour in the street

The needs of the users in the street depend on their activities in the street. Pedestrian activity or street life can be viewed as travel mode; pedestrian is defined as "one travelling on foot" (Owens, 1993). Street activities are more visible and prominent than activities that occur inside the building and concentration of the activities on street and their visibility from the street are important in order for the place to be noticeable and more attractive (Shamsuddin, 2011). However, according to Appleyard (1983), most of the streets are killed by the automobile for which they were built; from a social viewpoint they are dead places. The automobile, satisfier of private needs, has created an insatiable desire for access and virtual exclusion of other users.

Outdoor activities in public space can be divided into three categories: necessary activities (going to school or work, waiting for a bus or a person, shopping, etc.), optional activities (taking a walk, standing around enjoying life, or sitting) and social activities (children at play, greeting and conversation , seeing and hearing other people) (Gehl, 1987 ; Turel et al., 2007). Meanwhile, Rapoport (1987) divides pedestrian activity into two principle types: dynamic and static. Dynamic activities comprise walking, strolling and running, while static activities include standing, sitting, squatting, working and talking. Pedestrian street life and activities is not only affected by the physical variables but perceptual and cultural variables as well (Rapoport, 1987). Gehl (1986) argued that the categories of outdoor spaces are influenced by the quality and the character of the outdoor space. He adds that the activities and functions will be developed when the qualities of the space are improved (Gehl, 1986).

Frick (2007) argued that the factors that define the social public space are the character and behaviour of the people within the space. People frequent and enjoy some streets more than others, for physical reasons as well as for the activity or calm to be found there. Frick (2007) posited that the interactive relationship between the activities and behaviour' in the public space and the construction of public space, is imparted by its practical 'functionality' in space. Shamsuddin (2011) added that there is a symbiosis between human behaviour and the environment in which both affect each other. According to Frick (2007), the features listed under functionality and intelligibility is the basic criteria in the construction of public space. These criteria are to support the activities and behaviour in public spaces (Frick, 2007) (refer to Appendix 7). The main aspects of functionality that support all kind of activities in public space are accessibility, 'pleasant place', safety and multifunctional suitability, meanwhile criteria under intelligibility of public space that support the activities in public space enclosure (openness or closeness), overview or

subdivision and clearness (Rapoport(1986); Gehl (1996); Schneider(2000) in Frick(2007). Construction of the public space such as bounds of space or enclosure; dimension, scale and grain; distance between buildings; orientation of space; difference in level; and equipment (semi-fixed features) (Rapoport(1986); Gehl (1996); Schneider(2000) in Frick(2007).

Pedestrian activities on street are important to review because the need of users in street is depending on their activities and reasons of use. Rapoport (1986) argued that pedestrian activities can be discussed in terms of two types. The first type is 'dynamic' pedestrian behaviour, which mainly focuses on walking or strolling (table 2.1). These are comparatively constant in nature; culture influences how acceptable walking is, who walks, where and when, with whom and why. The second type is 'static' pedestrian activities such as sitting and standing, squatting, lying down, eating, playing, working and sleeping, etc. (table 2.1). Rapoport (1990) argued that pedestrian behaviour comprises two major aspects: cultural aspects, which are involved with desire, habit and propensity to walk, and the second aspect is perceptual, which needs to be satisfied for a setting to be supportive of walking. According to Rapoport (1986), these activities vary greatly with culture, where some activities in some countries would not be acceptable in another country. As supported by Shamsuddin (2011), cultural values affect the behaviour in streets and reflect the direct pedestrian response to the environment. She also added that climate also plays an important role in influencing behaviour patterns, and, thus, the townscape that responds to the climate will display a unique behavioural response and design features.

	Pedestrian Dynamic	Pedestrian Static
Cultural	Less influenced by culture	More influenced by culture
Temporal	Short exposure and stay in any one part	Long exposure and stay in a given part
Perceptual	Interest most important, but liking significant. Enclosure levels very high; fixed features most important, although semi fixed significant. Need to be enticed to explore and, hence, move.	Liking most important, but interest significant (mainly people) moderate enclosure levels. Semi fixed and non-fixed (people) more important. Need to be enticed to stay
Associational	Less important, although many cues such as litter, signs of deterioration, 'wrong' people, perceived safety, etc. are important	More important; cues such as those for dynamic spaces. Greenery very important; general association of soft, 'human' space, sheltering.
Instrumental	Some shelter (e.g., overhangs, arcades) can be significant.	Protection and shelter from microclimate and weather more

	Pavement quality. Visual complexity (+ other modalities) most important. Fumes, noise, etc., of some importance. Topography significant	important. Also absence of fumes, noise, smells, etc. Temperature important. Seats, tables, food, activities all more important.

Table 2.1: Characteristics of pedestrian Dynamic (Walking) and Pedestrian Static (Rest) in urban space, according to Rapoport (1986, p.171)

Supportive characteristics that influence the activities in street

There are also supportive characteristics that influence the activities in street. The supportive characteristics of physical and spatial features on street do influence type of activities within public space. Based on previous authors it was found the dimension of the streets, materials and conditions of the surface, walking distances (proximity), directions, spatial sequences and differences in level do affects the walking activity. The more details supportive characteristics Table 2.2 explains the relationship between the activities and behaviour of the street users with the supportive characteristics in the street based on previous authors.

Activities / behaviour within public space	Physical-Spatial Features	Empirical Values
1. Walking	-Dimensioning of streets -Paving materials and streets surface conditions -Walking distances (for most people) -Direct routes when the destination is in sight -Spatial sequences: no long, straight pedestrian routes; rather winding or interrupted streets -when large spaces are to be crossed: pedestrian routes along the edge(building's façade, arcades) -differences in level: street crossing as much of a horizontal fashion as possible; ramps rather than stairs	10 m (for 80-100 people/min) 400-500m
2.Standing (staying)	-At the edge of a space: under colonnades, awnings, sunshades along the facades; in niches, recessed entrances, porches, verandas, planting in the front yards -elsewhere in the space: on corners, in gateways; near column, trees, street lamps, bollards -In summary irregular façades and a variety of support within outdoor spaces	

3. Sitting	-'Primary seating': Benches and chairs placed in carefully chosen strategically correct locations; 'space within the space' , niches, corners; places that offer intimacy, security and good microclimate; view on whatever is going on in the space -physically comfortable (e.g., benches with backrests and well contoured chairs) and socially comfortable -'Secondary seating': stairways, pedestal, ledges, steps, low walls, etc.	42.5cm sitting heights and 70-90 cm deep 1.5 of ledge and step space -just right for sitting, eating and sunbathing
4. Seeing, hearing and talking	- The borders of the space corresponding to the limits to the 'social fields of vision' -Maximum distances for seeing events -Maximum distance for seeing facial expressions -Lighting of pedestrian areas being ample and well directed -Limited background noise, still enabling conversation - To hear other loud and soft sounds of voices, footsteps, song, etc. -Talking: benches opposite one another (not back to back) or placed at right angles	 70-100 m 20-25 m Less than 60 dec 40-50 dec
5. A pleasant place in every respect	- Protection from crime: access roads and open spaces clearly connected to the individuals residences in the form of precisely defined common areas (avoiding ' no man's land') -Protection from unpleasant weather , good access to good weather : sunny and wind protected outdoor spaces; low and attached buildings, placed along narrow streets, rather no high-rise buildings, windbreaks, trees, hedges, covered areas, etc.	
6. Soft edges	-Being able to stay next to buildings, linking indoors and outdoors; good resting areas directly in front of houses (doorways, semiprivate front yards, etc.); places to sit at the entrance doors -distances from the houses to the street not too great	 Less than 4 m

Table 2.2: Relationship between activities and behaviour of the user with the physical-spatial features in streets (Gehl, 1987); Gehl (1996) in Frick (2007; pp.269-270); Whyte, 1980).

It shows based on previous authors that, in order for the street to be used by people, the street should be designed to suit the activities. Davies (2000), in the Urban Design Compendium, suggested that if the street is a commercial street, the design should

enable the users to get to the shop, to cross the road and have other static and leisure activities, such as chatting and lingering in front of the shop windows (Davies, 2000).
The supportive characteristics of the street relate to the design effort concerning the functional aspects. According to Frick (2007), "the decisive factors in the design of public space are what actually constitute 'spatial synergy' and the 'supportive characteristics', and thus the features public space needs to support human activities and behaviour' (Frick, 2007). Jacobs (1996) stated that in the building and rebuilding of cities, there seem to have been little concentration of design effort on the functional; sensual arrangement of the streets themselves, their sizes, the detailed design of all their parts and their embellishments in the context of their particular city. Frank et al. (2003); Sealens et al. in Nazelle et al.(2009), argued that although the empirical evidence is not common, there are suggestions that certain attributes of the physical environment are related to more activities for utilitarian travel. Rapoport (1990) introduced the key and essential attributes of a dynamic pedestrian setting. He argued that in order to make a great street, it should have these supportive characteristics (Rapoport, 1990) (refer to appendix 7).

Freedom of action

Rivlin (1994), in his research findings identified that freedom of action is other factors that relate with peoples need on street. The existence of rules in using the space is important to the achievement of this freedom. Freedom of action is related to spatial right and social justice. *'Spatial rights involve freedom of use; most simply, the feeling that it is possible to use the space in a way that satisfies personal needs'* (Carr et al., p.137). Carr et al (1992) proposed four qualities that provide the opportunity for environmentally based analysis of freedom of use: access, freedom of action, claim and change.

Freedom of action reflects the second category of spatial rights. According to Lynch (1981, p.205) the meaning of freedom is "*the rights of use and action', of behaving freely in a place or using its facilities".* The urban environment should be open to all its users and all the street users should have equal opportunities for access to its services and benefits. However, most countries of the world today are experiencing problems with the freedom of action in their urban spaces. According to Carr et al. (1992), this problem occurs because of the competing interest with different society in space, most of the public spaces provided by the private group only serve their own interests and needs, private property acts to constrain the public's use and in other cases spaces dominated by the dominant groups eliminates other groups.

In the street, people should be free to watch other people. People watching are a frequently reported activity in urban space. Alexander et al (1977) noted that the need of people for their public life is a place where they can go and see people and to be seen. Whyte (1980) also indicated that watching activity is the most popular activity in urban space and the presence of people in a place will attract other people to use the place. This is supported by the study by Linday (1978) in Carr et al. (1992) and Alexander et al. (1977); and Whyte, (1980) that favourite sitting places are adjacent to the pedestrian flow, in particular, near street corners. Other attractions for the public user of urban space include the opportunity to observe performers and formal activities, as well as various physical features, for example, water fountains, views and so forth (Carr et al., 1992, Carmona et al., 2003). Buker and Montarzino (1983), in Carr et al. (1992), in their study of the qualities people prefer in outdoor spaces found that most, 98 per cent of their interviewees, choose water as the desired feature in urban space. Another type of passive engagement in public space that concerns the physical and aesthetic qualities of a site involves viewing public art or a compelling landscape.

Different people use spaces in different ways. As Carr et al. (1992) stated, although some people find satisfaction in people watching, others might prefer more direct contact with people regardless of whether they are strangers, families or members of their own group. According to Walzer (1986) in Woolley (2003), public space is space where people share with strangers, space for politics, space for commerce, space for religion; and space for peaceful coexistence and impersonal encounter. The conditions and characters expresses from the space affects public life, civic culture and everyday discourse of the users (Woolley, 2003). Whyte (1980,p.19), in his research in New York City, concluded that public spaces are not *'ideal places' for 'striking up acquaintances', and that even in the most sociable of them, there is not much mingling'* . He also noted that unusual features or occurrences in a plaza such as an entertainer or a fine sculpture will often result in what he calls 'triangulation' (Whyte, 1980). Hence, that feature provides a connection with people and other strangers within the space to talk to each other. As Alexander notes that, the importance of the promenades is that they are a place where *'people with a shared way of life gather together to rub shoulders and confirm their community'* (Alexander et al., 1977, p.169). Gehl (1987) argued that the opportunity to see and hear other people can also provide ideas and inspiration for action. Public space also plays a crucial role as a setting for socializing with their families, neighbours, friends and acquaintances. As Carmona et al. (2003) argued, successful urban spaces are

spaces that can offer a variety of opportunities of engagement and disengagement from contact.

People also seek for ceremony, celebrations and festivity in urban public space. In Carr et al. (1992) they note that people require entertainment to refresh their lives. Hence, through these qualities they can make people engage with watching other people, socialize, be entertained and also consume or buy foods and other goods. Whyte (1980) noted that the availability of food can also seed a place with activities.

Attractions and qualities engaged with eyes

Qualities that engage the eyes and attractions on street are other factors that user-friendly streets possess (Jacobs, 1996; Taylor, 1999). The qualities that engage the eyes involve visual complexity that keeps the eyes engaged and helps the eyes do what they want to do, must do and move where they want to go (Jacobs, 1996). This is supported by Taylor (1999) who noted that the quality of urban design also depends on the form and surface qualities of the object, which define and occupy spaces, be they buildings, trees or other manmade elements. Visual complexity is where there are many different surfaces over which light constantly moves that keeps the eyes engaged; separate buildings, many separates windows or doors, or surfaces changes (Jacobs, 1996). Whyte (1980) suggested that sightlines are important in order for people to see the space because people will not use the space that they do not see (Whyte, 1980). This was proven in his research in that space that was not seen by the users/passer-by like sunken plazas, were not being used by people and turned into dead spaces (Whyte, 1980). Street planting can also attract people's eyes to the street, instead of defining the street, separating the pedestrian realm from the vehicles, and providing shade, the movement of trees, their branches and leaves, and the ever changing light that plays on surfaces (Jacobs, 1996).

Qualities engaged with eyes are related to attractiveness. Aesthetical values and entertainment qualities also serve to enhance a city's desirability and attractiveness (JBPD, 2002). In the case of streets, concentration on attractiveness is intricate places that are related to the scale of people walking (Tibbalds, 1992). Urban design is also concerned with the aesthetic values and the behaviour settings that constitute the lives of a city's inhabitants, the relationship of these settings to each other and the way the physical milieu affords the potential behaviour that might take place within it (Lang, 1996; Taylor, 1999).

Based on previous studies it was also proven that different cultures and groups of people tend to perform different behaviours and activities in street. The detail discussion regards to social and cultural influences in street will discuss in next section (see section 2.4 below). However, things that might be the supportive characters to activities and behaviour in Western and European countries might not be the supportive elements that affect the activities and behaviours in the Malaysian urban commercial streets in Kuala Lumpur city centre context. Therefore, the study is needed to look at the relationships between physical characters of the street in Malaysia context with users activities revealed on site. This can help to achieve the objectives in identifying and determining the factors and attributes that support the activities on the urban commercial street in Kuala Lumpur city centre, which at the same time contributes to the use of the street.

2.4 Influence of socio-demographic background on user-friendly street

Apart from the physical environment, the social and cultural backgrounds of the user in the street are important in respect of the need and use of space. Gan (1993) argued that in an urban environment, the social environment has considerably more effect compared to the physical environment. This is because physical activity is associated with demographic factors and self reported barriers to participation. Participation is associated with proximity to facilities, cost, lack of time, motivation and skill (Craig et al, 2002). Rapoport, (1987) and Lawson (2001) argued that different cultural and social groups tend to have different traditions, costumes and habits with regards to use of street space.

However, a significant variety within group means that it is vital to have a participatory design process or very flexible urban space designs in order to cater for such internal diversity (Lawson, 2001). Lynch argued that the quality of the place is due to the interrelation effect of the place and the society that occupies it (Lynch, 1981). Acceptable street behaviour in the UK or US might not be acceptable in Malaysia. The growing differentiation of lifestyles may cause conflicts between the users of public spaces. Melik et al. (2007) argued that individuals increasingly claim particular spaces as their own, where they go to meet the people they want to meet and avoid those they do not want to see. Each town is a different place to each individual who lives, works or visits there (Melik et al., 2007).

Every space has different associations for different groups of people (Worpole, 1992). As according to Sideris (1995), there are significant differences between racial groups in the way each group comes to the park, type of group association at the park, type of

activities engaged in at the park and the most liked park activities (Sideris, 1995). She also stressed that contemporary public space does not offer an effective group setting that takes into account the different use patterns of men, women, children, young adults, elderly, different ethnic groups, or the homeless (Sideris, 1995). Therefore, the urban designers need to understand the populations that they are working with on three levels: the general public, subgroups (such as children, ethnic) and individuals (Forsyth, 2003). Sideris (1995) also found that different social groups typically coexist in the parks, but they do not tend to mix. Hence, they keep to their own spatial territory (Sideris, 1995). Public spaces are occupied by different people doing different things and many settings deliberately favour some dominant groups (Lynch, 1981). Dickens (1989) suggested that there are also relations stemming from the innate biological drives affecting peoples' actions. Combining with the class and power relations actively made by human beings, these innately generated social practices have, he argued, major social, economic and political implications.

Rapoport (1987) argued that cultural variables are primarily for any activity, including walking and others, occurring in streets. It is culture that structures behaviour and helps explain the use and non-use of streets and other urban spaces. The use of streets by pedestrians is primarily culturally based as the physical environment does not determine behaviour. However, the physical environment can be supportive or inhibiting. According to Bridge (2010), urban planning initiatives that fail to address population demographics, socio cultural expectations or based on developer led innovation may fail to provide accessible, comfortable amenities in a thoughtful manner and are those most likely to be outmoded in the future. Ability to move freely, see clearly and to be independent is very important in any human's life and will change over time (Bridge, 2010). The next section discusses the differences in use of the urban spaces from different life cycle, gender, economic status, ethnic groups and degree of experience with the space based on previous studies.

2.4.1 Life cycle

Age is perhaps the most important dimension in terms of differences in use of urban space. Sisiopiku et al. (2003), in his study, found that there is a significant difference between the responses obtained from respondents from different age groups. Different age groups have different physical needs but may also perceive open space differently (Forysth, 2003). According to Turel et al. (2007) in their study of the use of open space by elderly people in Bornova District, Turkey, the major problems that the elderly people in

the public spaces identified, were pavements and roads, second is pollution, third is safety, forth is maintenance and management, fifth is traffic and finally socio-cultural problems. According to Harrison (1997) in Turel et al. (2007), in designing outdoor spaces for elderly, accessibility, mobility, ease of activity, safety, amenity, community and social connections must be taken into consideration.

Research on housing areas, on open spaces, on the needs of children and the elderly in both everyday and special environments, and aesthetic concerns has, as yet, been largely neglected (Lang, 1996). The ageing process can pose a number of physical and mental challenges that adversely affect people's functional abilities in a number of ways if the design of the built environment does not address these challenges (Burton et al., 2006). Older people are also more likely to injure themselves by falling than younger adults; in the UK, falls are the most common cause of death from injury in people aged over 75 years (Campbell, 2005). Burton et al. (2006) in their study on what problems the older people face when they go out found that difficulties in walking, fear of falling difficulties of walking and fear of getting lost are among the factors. How participants thought the outdoor environment could be improved is adapted from Burton et al. (2006)

In all major cities in the world, the most vulnerable groups, i.e., the poor, the elderly, children, women and ethnic minorities, have been exposed to the risks of social exclusion, a phenomenon that has come to the fore in understanding cities and developing policies for them (Madanipour, 2004). A very serious challenge in the use of public spaces is by those who use it most, and, thus, tend discourage to others from using it, as they are seen by others as attempting to dominate the place. The most intensive use of public spaces in European cities is perhaps by youth, especially teenage boys (Madanipour, 2004). Sideris (1995) found that younger adults (19-39) seemed to divide their preferences among the aesthetic, social, relaxation, and psychological qualities of urban parks elderly users stressed the social contact. Elderly people find it very difficult to tolerate places that have too many activities (Carr et al., 1992). Topography, such as hills and slopes, however, affect people differently, for example, the elderly or handicapped (Rapoport, 1990).

Public space is a stage for performance and contest for young people; it is a place where a developing sense of self identity is tested out in relation to their friends and other groups of society (Travlou, 2003, Ward Thompson et al., 2004 in Travlou, 2007). Young people use public space to hang out as these places offer them more autonomy and freedom from parental supervision. However, the response from other groups in society

is often negative; young people are often related to problems and are responsible for crime in public spaces (Travlou, 2007). Matthew (1999) suggested that local streets are an important social forum for young people, during school holidays to hang around with friends. The social importance of the street is heightened for many young people because the home does not provide a suitable or appropriate venue to meet and talk with friends. Streets afford young people settings in which they can escape from being with adults, socialise with people of their own age, and develop their own sense of identity. Malone (2002) stated that the youngsters use streets as a place for expressing their own culture, which is normally misunderstood by other groups of people, especially adults.

2.4.2 Gender

Another dimension that shows differences in the use and perception of the open spaces is gender. Previous studies in street, found that there is a significant difference between the responses obtained from respondents from different genders (Sideris, 1995; Sisiopiku et al., 2003). In the research by Sideris (1995), it was found that women are the minority group that use urban space. In her studies on urban parks, she also found that more men than women seemed to enjoy the social role of the parks (Sideris, 1995). Many women's perceptions and use of urban space is restricted by the logic of social dominance and safety (Whyte, 1980; Tonkiss 2005). For women urban spaces are not only a space of freedom for women but also as a site of danger (Tonkiss, 2005). Women's fear of male violence is manifested as a fear of space (Tonkiss, 2005). Women always feel discriminating and sensitive to annoyances even though in public places (Whyte, 1980). Al-Azzami (2004), however, found that in terms of walking trips on streets, women make significantly more than men but men tended to walk further. In terms of the concern with air pollution, men are more concerned than women (Abbaszadeh et al., 2007).

2.4.3 Level of income or social - economic status

Socio-economic status is likely to have a vital influence in the way people use and behave in public space (Sideris, 1995). A study in Morocco noted that middle class women were frequently seen in public, traditional women were only seen in semi-private communal spaces in informal settlements (Payne, 2005). Arefi et al.(2003) agreed with this statement, because based on their research in Visakhapatnam, India, they found that lower socio-economic status people have a more complex perception than high economic status people. Sideris (1995), in her research, found that lower income groups are more dependent on public space than affluent groups. She stated that the higher income

groups normally preferred to use more private open space (Sideris, 1995) whereas, lower income groups tend to have reduced mobility and are more reliant on public transport (Sideris, 1995; Carmona et al., 2003). This situation can affect their accessibility to urban space, especially car dependent spaces.

2.4.4 Culture/ ethnic groups

Studies in the US have found that groups of Asian people are very varied in their use of open space, partly because the populations come from many different backgrounds. Many ethnic groups have gender segregated patterns of open space use (Forsyth, 2003). Oktay (1990) stressed that meanings and functions in places are different for each of the cultural groups, nor do the centres have to be clearly demarcated by physical features but they must have an inside that can be experienced as something differing from an outside. Therefore according to Sideris (1995), in order to respond to cultural needs, urban space design should be location and context specific. Hence, she adds that the design should not cause tension between different groups, but rather should promote their peaceful coexistence (Sideris, 1995). In contrast, Whyte (1980) found in his research that despite cultural differences the pattern in which different cultures used the park are much the same. Arefi & Meyers (2003) research studies have also emphasized that public space is a reflection of the cultural values and practices of various ethnic groups and social class strata.

2.4.5 Residence and degree of experience

Ismail et al. (2007) in their research, in Putrajaya, Malaysia, found that residents have different needs than visitors, who only used the town temporarily, and, thus, are able to tolerate any shortcomings of the town. City residents and sub-urban residents conduct different activities in urban spaces. Therefore, residential status will affect the use, needs and expectations in urban spaces (Loukaitou-Sideris, 1995; Forsyth, 2003). This is supported by Whyte (1980) in his research in which most of the people who used the plaza are the people nearby. Ujang (2008), in her study of urban commercial streets in Kuala Lumpur, found that the degree of experience with the street makes the street users feel more attached and this affects their uses, needs and expectations of the street.

2.5 Conclusion

This chapter discusses the theories concerning urban public place, needs in public space, human activities and behaviour in public space and influence of social and cultural in urban spaces in order to identify the gap of knowledge. From the discussion, streets in Malaysia play a vital role in the planning and urban design and serve more functional purposes in Malaysia compared to other public spaces. Streets are places of significance for many aspects. They not only act as an access but also as an arena for social expression. Previous studies have acknowledged the link between the uses and activities on the street with the physical design and character of the streets. The right characteristics of the street will encourage people to use the street. The character of the street varies according to the purpose and function, physical form and appearance, socio economic and cultural characteristics of the users. Therefore, research on a friendly street involves the physical, functional, perceptual and socio cultural dimension of the street.

This chapter also discusses human dimensions, the user's needs in public spaces and the supportive characteristics of urban space that can affect human behaviour and activities in the space. It appears from the literature that the parts or the components in urban space influence the way humans behave in that space. Research in many Western countries shows other major aspects that affect human behaviour and activities in the space are the social or cultural characteristic of the users.

Although there is an absence of research and studies in countries that share the same types of environment and socio-cultural characteristics as Malaysia, the literature from western countries can provide a platform for comparison as well as basis for the study of how the interrelation between the space and human behaviour occurs. With reference to the theoretical framework established in Chapter 3, the study of the relationship between the characteristics of the streets and users preferences and actual needs are used for an investigation of the factors that make a street friendly to the street users in the Malaysian context. The next chapter will discuss how user-friendly streets are perceived and the qualities and characteristics of the street environment that contribute and influence the use of the street and at the same time contribute to user-friendly urban commercial streets in Malaysia.

CHAPTER THREE

PARAMETER AND CRITERIA FOR THE CONCEPT OF A USER-FRIENDLY URBAN COMMERCIAL STREET

3.0 Introduction

This chapter discusses the parameter for the concepts and the criteria for user-friendly urban commercial streets, as well as the current body of knowledge concerning the main attributes and characteristics that determine a user-friendly street.

This chapter is divided into four sections. The first section considers the concept of a user-friendly street. The second section identifies the related physical dimension and characteristics of the street that are associated with a user-friendly street. The third discusses the functional dimension of a street in general that would influence the friendliness of the street to users. The conclusion to the discussion in this chapter is summarize the key attributes are, as identified in the literature from previous sections above.

3.1 Concepts of a user-friendly urban commercial street

As per discussed in chapter one (refer to page 1) , a user-friendly street is related with a street that is inclusive to all (Burton et al, 2006 ;Yaakub et al, 2009); a street that fulfils the needs of all users (Tibbalds (1992); a street that is usable, accessible and safe to all member of society; and one that is strongly shaped by functional, emotion, physical and socio-cultural attributes and climate (Burton et al, 2006;Yaakub et al, 2009;Shamsuddin et al., 2008).

In Malaysia, JBPD (2003) has identified the principles that define a friendly city to the users where a street is the subset of a city. The principles that are applied in developing a friendly city are fairness (in planning and development according to needs and allocation), friendliness (to encourage community interaction), effective transportation systems (that cater to all pedestrians including the physically-challenged), balance (to provide physical, social and economic balance in the formation of caring society) and the human-nature relationships (to emphasize values like cleanliness, beauty, and conservation). A friendly city places a strong emphasis on welfare and consumer benefit, and, hence, a suitable environment for urban communities. The priority in the fabrication

of a city lies in equally distributed and strategically located amenities and excellent provision of infrastructure and utilities catering to all urbanites including the under privileged or handicapped. Efficient transportation and pedestrian facilities connect major locations, especially between recreational areas and tourist attractions.

Usability is one of the factors associated with a user-friendly street. According to Alexander (2008), usability is a cultural phenomenon that can only be improved through a better understanding of user experience, which is considered as situated action in a specific context. Jacobs (1996) provided a thorough definition of a great street, which is related to the definition of a friendly street. Jacobs (1996) suggested that a street should facilitate people acting and interacting. Therefore, a street must be accessible to all, easy to get to and should be a most desirable place to be, to spend time, to live, to play and to work.

User-friendly relates to the theory of inclusive environments of a street where accessibility, safety and usability are the framework for inclusive design (Yaakub et al., 2009). According to Burton et al. (2006), the meaning of inclusive design is designing products, services and environments that as many people as possible can use. In the case of a street, an inclusive street is a street that can be used by all groups of people regardless of age and ability. Users of the street environment are anyone who is interested in their local environment and streets (Burton et al., 2006). Disability is the loss or limitation of opportunities to take part in society on an equal level with others due to social and environmental barriers (Yaakub et al., 2009). Burton et al. (2006) argued that the design of the built environment to meet the needs of people must focus on disabilities rather than on environmental barriers. Lavery et al. (1996) in Burton et al. (2006, p.189) state: *'Designers must be aware of the fact that designing for the "average' person is a thing of the past. The challenge of designing the 'Friendly Street' is a formidable one. The end product must not present a hazard to anyone: young or old, fit or frail".* Currently, most of the streets in Malaysia have been designed with the average young and healthy male in mind (Yaakub et al., 2009). Therefore, in this research the study focuses on the needs of the street users, the design of a street environment that is inclusive to all in respect of physical and functional dimensions.

Another theory that relates to a user-friendly street is responsive environments. Bentley et al. (1985) argued that the built environment should provide its users with an essentially democratic setting, enriching their opportunities by maximizing the degree of choice available to them. They suggested seven key issues that a street should have in order to

make the streets responsive. A 'responsive' street is a street that has permeability, variety, legibility, visual appropriateness, personalization and richness (Bentley et al., 1985). Permeability in street spaces depends on the number of alternative routes it offers from one point to another point (Bentley et al., 1985). The absence of alternative routes will cause discontinuity to the street and reduce the permeability level of the street (Carmona et al., 2003). As Shamsuddin (2011) added, these alternative routes must be physically accessible and visible. Variety refers to a street that offers a choice of experience to the users (Bentley, 1985). Legibility refers to a street that is easy for people to understand the layout. Visual appropriateness is the visual qualities that the street offers the look like in more detail. In the case of a urban commercial street like JTAR, legibility is important for the shoppers to help them explore the shops that they want to go to. Therefore, the presence of user friendly maps is important to guide them (Amry, 2011). This was proven in Singapore by how they attracted shopaholics to Singapore by providing user-friendly maps that indicate the best shopping areas and tips on how to reach the destinations via public transport (Amry, 2011). Meanwhile, richness is related to the choice of experience in the street that the users can enjoy which is not limited to visual but involves other senses, such as smell, hearing, motion and touch. The last is personalization, which is important to the users to feel comfortable in that space, where people can put their own stamp on the environment (Bentley at al., 1985).

A review of related literature suggests that there are three major criteria that contribute to a friendly street: physical qualities, activities or functional qualities, and social qualities. All this gives meaning to the street that makes the street friendly or not. Place researchers focusing on the facets of a place identify three majors an aspect of one's valued setting: environmental (physical, social and temporal), behavioural and symbolic (meaning, conception and identity) (Relph, 1976; Canter 1977; Rowles, 1983; Gustafson, 2000) in Min et al. (2006)). They maintain that behavioural processes, continued interactions and pursuits for meeting personal needs are a core mode for giving personal meaning and value to the setting (Min et al., 2006).

Liveability is another theory that relate with user-friendly street. It is natural that every public street will swell out at those important nodes where there is the most activity (Alexander, 1977). According to Jacobs (1996), liveability is the physical quality that is required in order to make a great street. Climate also plays a significant role in determining a liveable city. In urban spaces, the roadside is the location for most of the activities that characterize urban living. This includes sidewalks, street cafes, seating and most non-motorized activity. Hence, liveability encourages the placement of street trees,

landscaping, aesthetic street lights and other roadside features along the edge of the vehicle travel way to both increase a street's aesthetic appeal, and also to physically create a buffer to pedestrians from potentially hazardous oncoming traffic (Dumbaugh, 2005). Jacobs (1996) stressed that many of the best streets have lots of people on them. Alexander at al. (1977) suggested that places with less than one person for every 150-300 square feet of paved surface will seem dead and uninviting. Most of the city activities close at night. Many people do not go out at night because they feel they have no place to go. A place, particularly when it is full of light and function, can attract people to come (Alexander et al., 1977).

Successful urban places for the users not only depend on good urban form but also from an underlying dynamic activity of the place (Sherman, 1988 in Knox, 2005). The attributes of successful places are plenty of informal, casual meetings and gossip; friendly bars and a variety of settings in which to purchase and/or consume food; street markets; variety of comfortable places to sit, wait and people-watch, sense of belonging, affection, hospitality, vitality and historical and cultural continuity (Montgomery, 1998 in Knox 2005). Montgomery (2001) argued that all good cities have distinctive identities and characters. Cities stimulate all senses, and, therefore, an active street life ensures that city centres are patronized and remembered by people (Montgomery, 2001). Successful places typically have animation and vitality. Jacobs (1993) argued that bringing people onto the street creates animation and vitality (Jacobs, 1993). According to Rapoport (1977), activity in any given setting is primarily culturally based in that it is the result of unwritten rules, customs, traditions, habits, and the prevailing lifestyle and the definition of activities appropriate to that setting. In many cases, places are known because of certain activities that occur on the street (Sulaiman et al, 2008). Pocock (1978) argued that the attributes of physical form are more meaningful when they reinforce usage or activity patterns. He suggested that the congruence between form and activity is important in terms of general orientation and comfort. Canter (1977) saw places as the function of 'activities' plus 'physical attributes' plus 'conceptions'.

In creating a liveable street, there is a need to make sure that streets are clean, safe and inspiring; all the qualities mentioned previously should be present. Litter and graffiti should be tackled ruthlessly. The fear of crime should be reduced through urban design, lighting and visible presence of the police and other uniformed officials. Money should be spent on fountains, sculptures, trees and festivals of music and performances (Plowden, 2001). Plowden (2001) suggested that streets are the arena for community life. They need to allow quick, safe and sufficient movement on foot from place to place. In addition,

they need to provide social spaces for playing, thinking and shopping. Urban quality for pedestrians the quality of the urban environment, hence, depends on a complex interlacing of functional, spatial and cultural aspects; in particular, the quality of the spaces dedicated to pedestrians is tightly related to their possibilities of mobility, of exchange and of relationship. Urban qualities vary according to the function of the user, of the place and of their various specific uses, and, above all, changes with time and with the related culture, habits, taste and considerations; it is then a relative value, and, as such, it is not easily defined and cannot be settled once and for all (Martincigh, 2003). It is important to note that most of the attractive recreational and social activities that are associated with walking depend on the good quality of the physical environment. Only when the environment is inviting and pleasant will walkers be inspired to enjoy all the other nice aspects of city life (Gehl, 2000). Nazelle et al. (2009) in their study found that, personal health, community vibrancy, and global climate change are frequent justifications for promoting pedestrian friendly environments.

Mixed use affects the liveability of the street. Antupit et al. (1996) suggested that to support high levels of pedestrian activity and create new people friendly places, a vital mix of uses characterised by, pedestrian-scaled, transit serviceable and compact neighbourhood centres is important. Mixed use and activities are more than just collections of buildings criss-crossed by roads and augmented by the occasional park. They are essentially for and about people and accommodate their activities (Tibblads, 1996). According to Tibbalds (1996), the more well-used and varied the users, the more they are likely to have the quality of people friendliness, the more lively and safe the streets. Mixed use streets, and places with buildings and architectural features in a variety of local styles, sizes, materials, colours and shapes make a place more interesting to walk around (Bourton et al., 2006).

In the case of Tuanku Abdul Rahman Street Kuala Lumpur, the variety of activities inside the buildings as well as on the street creates a sense of life and vitality to the townscape (Shamsuddin, 2011). The presence of a variety of people on the street contributes to the variety of activities taking place on the street. A mixture of activities and use can create a successful community and public space that enables the street to attract more people to come (Shamsuddin, 2011). Hence, she adds that the benefits of mixing use and activities are that there will be a better choice for social interaction, visual stimulation more effective use of spaces and buildings, a variety of users and a secure environment due to the presence of 'eyes on street'.

In conclusion, a user-friendly street is a street that fulfils the needs of its users with the quality of the built environment in the aspects of physical, functional, social quality and meaning. This discussion explains the concepts of user-friendly and related theories. However, most of the theories that relate to friendly urban spaces are based on other places and not specifically to urban commercial streets in the Malaysian context generally and to urban-commercial street in Kuala Lumpur city centre specifically.

3.2 Attributes and characteristics of a user-friendly street

Physical design and characteristics of a street that associated with a user-friendly street

The physical design of a street is the actual structure of a place, which include buildings, landscape, climate and aesthetic quality (Shamsuddin, 1997; Shamsuddin et al, 2004; Carmona, 2003), it is the objects in the setting (places); natural elements, manmade features and climate; relation between places created by walls, distance, windows, barriers; and qualities of setting (Zeisel, 1981; Rapoport, 1977 in Shamsuddin 1997). Physical qualities that are required for great streets include bringing people together, participation and responsibility (Jacobs, 1996). Meanwhile, the physical environment quality is related to the planning process and urban design, which has a relationship with the street character and environmental space (Shirvani, 1985). The elements of street characteristics comprise land use buildings, circulation and parking space, open spaces, supportive activities, signage and conservation (Shirvani, 1985). All these elements influence human behaviour and the ways in which cities operate (Gehl, 2010). Therefore, the understanding of why the physical design and characteristics of the street are important is to make sure that all the changes of these elements will affect the users' pattern of uses and activities, their physiological well being and also the socio cultural identity in the Malaysia context. This will be discussed in later chapter.

3.2.1 Definition, proportion and dimension

A friendly street must have definition, proportion and dimension (Jacobs, 1996). In creating street definition, the street width, building height, topography and intervening visual intrusion, such as trees and signs, must be taken into account (Jacobs, 1996). Since a street has only two walls to define space, these two walls define the boundaries of the street and mark clearly where the edges of the street are that set street apart, and which define the street as a place and keep the eyes focus on the street (Jacobs 2003).

Streets are defined in two ways: vertically, which has to do with the height of the buildings or walls or trees along a street, and horizontally, which has to do with the length of and spacing between whatever is doing the defining. The horizontal elements that defining the streets are always the floor, usually buildings, but sometimes walls, trees, sometimes trees and walls (Jacobs, 2003).

Street definition

The spacing of buildings is also an important factor in respect of street definition. The sizes and arrangement provide or deny light and shade. In a very elementary way, the street allows people to be outside, in places of social and commercial encounter and exchange. Jacob (1996) found that a tighter spacing is more effective in enhancing street definition rather than looser spacing. In respect of street length, Sitte (1986) recommended that the plan of a public square should not have dimensions where the lengths of its wall are greater than a ratio of 3:1. The upper limit for the uninterrupted length of a street is probably in the order of 1,500 metre (1 mile) beyond this distance the human scale is lost. Even with vistas considerably shorter than 1,500 metre the closure of the view causes considerable difficulty. In addition, a curved street is more picturesque than a straight street (Moughtin, 2003). The arrangement of the buildings affects the street definition and also contributes to what Alexander called 'positive space'. There are two kinds of urban spaces: 'negative space' and 'positive space'. According to Alexander (1987), it is essential for urban design to create 'positive urban space', which is space enclosed by the buildings, rather than what is left over after the construction of buildings. In creating 'positive space', there are five elements of physical design involved: pedestrian space, buildings, streets, parking, and gardens (Alexander, 1987). He noted that the space becomes the main focus of attention and the buildings become the tools with which this all important space is created (Alexander, 1987). In outdoor space, the space is negative when it is shapeless and the space is positive when it has a distinct shape, when it is shaped by the walls or buildings around it (Alexander et al., 1977). Alexander et al. (1977), in their hypothesis, stated that people feel much more comfortable in the use of 'positive space' compared to 'negative space'. When this happens in the urban space, the negative space tends to become residual and dilapidated space.

Street proportion and dimension

The proportion and dimension of the width and height in the street is also important for the ease of movement, safety, sun, wind flow and military access which contribute to user-friendly street (Jacobs, 1996). Proportion is the method by which visual order is

established. Jacobs (1996) conclude that a building height of three storeys (approximately 30 feet) and a width of 36 feet, with a street width of 72 feet, are the maximum dimensions for buildings of human scale. The smaller intimate scale requires a building height of 21 feet, a building width of 24 feet, and street width of 48 feet. Palladio says that in (Moughtin, 1992) hot countries, the streets ought to be narrow, and the houses high, so that it will provide shelter from the sun by the shade of the building and the narrowness of the buildings. Moughtin (1992) stressed that such practical considerations as climate, however important, do not eliminate the need to consider scale, proportion and street composition, they simply set the parameters for their consideration (Moughtin, 1992).

The context of definition, proportion and dimensions are the factors that need to be determined whether or not they are relevant and important in terms of the use of the street in Malaysia. There may be different measurements in terms of these proportion, definition and dimension that are suitable in the Malaysian urban commercial street context.

3.2.2 Sense of enclosure

Sense of enclosure is another physical quality that a street should have in order to be a friendly street (Oktay, 1990). Cullen (1996) defined enclosure as a space that provides a complete private world, which is inward looking, static and self sufficient. The height and width ratio contribute to the level of enclosure for streets and a street in its physical sense of enclosure is defined by the series of buildings on both sides where the ratio of the width of the street to the height of the enclosing buildings is critical for good street design (Moughtin, 1992, Abdallah 2006). If a street is long and wide with two-storey houses ranged (low in relation to the width) along a common frontage all sense of enclosure is lost (Carmona et al., 2003; Moughtin, 1992; Rappoport, 1990). Jacobs (1996) noted that a wider street needed more mass or height to define it. Therefore, dense planting and an avenue planting of streets do little to lift the spirit and relieve monotony (Moughtin, 1992). However, Gibberd's recommendation in Moughtin (1992) for street design is that a wide street is most unsuitable for shopping and a narrow pedestrianized city street with a continuous enclosing wall slightly higher than the street width is the most successful for their purpose as well as being an attractive place (Moughtin, 1992). Moughtin (1992) added that narrow streets also facilitate shopping, movement from side to side for window gazing, has no impediment and indeed is inviting by the physical form of the development. The characteristic of commercial streets, as described by Krier (1991),

should be relatively narrower than the residential street, so that the passer-by can cast an eye over all the goods on display in the shop opposite without having to cross the road (Krier, 1991).

This sense of enclosure can only be felt in the traditional streets where the streets are quite narrow and the observers' attention is fixed towards the details of the treatment of the façade (Oktay, 1990). Moughtin (1992) suggested that when streets are narrow (6-9m) and flanking buildings are 3 or 4 storeys it gives 'the sense of completeness' in the streets. The ratio (vertical to horizontal) of 1: 2 and 1:2.5 is the best to provide the sense of enclosure in a street (Carmona et al., 2003; Rapoport, 1990). As Jacobs (1996) noted, based on their studies, this ratio can help determine the proportion at which street definition is most likely experienced. The minimum for comfortable streets is approximately 1:1 (Jacobs, 1996; Carmona et al., 2003). In a street with a ratio of 1:4, there are times when there is as much sky as wall within the range of vision, giving a weak sense of enclosure. When the view from the sky is less dominant, it will increase the sense of enclosure of the space. A street wall height that equals the street width severely limits the sky view and gives a strong sense of enclosure (Carmona et al, 2003). However, if the surrounding building height exceeds the width of the space then the top of the buildings will no longer be visible without looking up, this condition may lead to feelings of claustrophobia and will reduce light penetration into the space (Carmona et al, 2003).

Scale is related to sense of enclosure and sense of place. Scale depends upon the comparison of a set of dimensions with another set; the relationship of buildings and urban space to the size of human beings is important to achieve a 'sense of place' (Oktay, 1990). Therefore, high-rise buildings do not create open space; hence, they destroy the townscape, social life, promote crime, crack the open space near them and damage the light, air and view in the urban space (Alexander et al, 1977).Spatial quality also depends on the scale of the unit, understood as 'human scale' and is related to the ratio of height to width measured along a section line (Oktay, 1990).

In the case of Malaysian streets, most of the urban commercial streets fail to provide a sense of enclosure to the user due to the design of the buildings and also because the streets give priority to the cars. As Shamsuddin et al. (2001) argued, the design of modern 'shophouses' since the 1970s has also failed to provide the sense of enclosure that the five-foot walkway did. Hence, the increased road width and presence of a slip road between the street and the shophouses tends to reduce the feeling of enclosure in

the street because of the increased ratio of the total street width to building height (Shamsuddin, 2001). The discussion indicates that the height of buildings, the width of the street and continuity of the buildings along the street are the main aspects that contribute to a sense of enclosure. This is considered important in respect of a user-friendly street in western countries.

3.2.3 Transparency

The best streets have about them a quality of transparency at their edges, where the public realm of the street and the less public meet (Jacobs, 1996). Transparency is important to give a sense of comfort and safety to the users on the street. Lynch (1981) argued that transparency is the quality of the street that people can directly perceive the operation of various technical functions, activities, social and natural processes that occurs in streets that convey a sense of life. Usually the elements that contribute to transparency in the street includes windows and doors that invite you and show you what is inside and act as a transition zone between the street and the actual shop doorways. Windows are also important for the person on the street to have a sense of habitation and possible comfort or refuge inside and for the inhabitant to have visual access to the public realm, as a natural surveillance (Whyte, 1980; Jacobs, 1996).

In the case of a commercial street, retailing, stores, windows with display, doorways are also a key feature of streets (Whyte, 1980). Shamsuddin (2011) argued that transparency is important to ensure that the activities that happen indoors are visible to outdoors and vice versa. She added that most of the modern buildings nowadays withdraw from the street thereby shutting the activities within that cause the street to cease to function effectively and cause the townscape become alienated (Shamsuddin,2011).

3.2.4 Unity

Unity is also an important physical character of streets. Allan Jacobs (1996) suggested that the buildings in the street get along with each other; they are not the same but express respect for one another in height and the way they look. One of the factors that contribute to a unified street design is the form of the buildings. According to Moughtin (1992), the spaces will lose their definition if they have a variety of form, styles and treatments. Gibberd in (Moughtin, 1992) argued that the street is a space in which the users are grouped to form a series of street pictures that may be expanded into wider spaces like squares. The use of common materials, details and architectural elements

can strengthen the unity in street scenes. However, the use of quite irregular building façades, building heights, skyline, and others are also needed in order to avoid monotony. However, a straight street, by its nature, is formal in character and its successful design demands a more precise consideration and definitions of parts. Absolute similarities of the individual building that comprise a straight street is not necessarily essential, it is often sufficient to have one strong motif at ground level which pulls the group together (Moughtin, 1992). Rapoport (1977) suggested that physical differences, such as shape size, height, colour, materials, texture, details, location and movement, must be noticed by the perceiver. The use of common materials, details and architectural elements strengthen the unity in many street scenes. Harmony in architecture is achieved if elements in a building conform to certain ratios that relate continuously to all other ratios (Moughtin, 2003).

3.3 Qualities of the street associated with a user-friendly urban commercial street

In urban commercial streets the qualities of the street are important in order to draw people to them. As Jacobs (1996) noted that an essential quality of urban public is that they meet the needs of users. The qualities of the street and other public places that make people use the spaces based on previous studies are used as qualities of the street associated with user friendly urban-commercial street. As mentioned in chapter two (2) that user-friendly street is associated with the uses of the street. Therefore, the functional qualities of the street are the activities that relates to how people interact with the street and how the buildings, landscape and other elements in the space are used (Shamsuddin et al, 2004). Usage and activity are often used as measures of successful urban spaces. Carmona et al. (2003) stated that, "successful public places are characterized by the presence of people".

In this section, the qualities discussed are those most frequently quoted by various scholars. The summary of the qualities, as identified by various scholars, determined that the most frequently quoted qualities that are associated with a user-friendly street are comfort and convenience; safety and security; accessibility and linkages; and the sociability quality (uses and activities). This is supported by the Project for Public Spaces PPS (2003), which identified the qualities that make a great place by four key attributes, uses and activities; comfort and image; access and linkages; and sociability (Table 3. 1).

Key attributes	Intangibles	Measurements
1. Uses and activity	Fun, active, vital, special, real,useful,indigenous, celebratory, sustainable	Local business ownership, land use patterns, property values, rent levels and retail sales
2.Comfort and image	Safe, clean, 'green', walkable, sittable, spiritual, charming, attractive and historic	Crime statistics, sanitation rating, building conditions, environmental data
3. Access and linkages	Continuity, proximity, connected, readable, walkable, convenient and accessible.	Traffic data, mode splits, transit usage, pedestrian activity, parking usage patterns
4. Sociability	Diverse, stewardship, cooperative, neighbourly, pride, friendly, interactive and welcoming.	Number of women, children and elderly, social network, volunteerism, evening use and street life.

Table 3:1 Qualities that make a great place

Source: PPS (2005)

In this research the most mentioned qualities that relate to a user-friendly urban commercial street have been identified (refer to appendix 1). Based on the literature review it was found that the distinct qualities that a public space should have are;

3.3.1 Comfort and convenience

In order for a street to be used and be the best place to walk, the street must offer a 'sense of comfort' and pleasing (Jacobs, 1996). Lynch (1981) suggested the fundamental of comfort, and stated that vitality as part of comfort, which is the form of the settlement that supports the vital functions, the biological requirements and capabilities of inhabitants. He suggested that in order to achieve a vital place there are three principal features: sustenance, which relates to adequate supply of food, energy, water and air; safety, which is the absence or control of hazards, poisons and diseases; and consonance, the spatial environment should be conducive to maintaining its micro-

climate (Lynch, 1981). However, in the case of urban streets, comfort refers to the extent to which streets enable people to visit places of their choice without physical and mental discomposure. Comfortable streets are calm, welcoming and pedestrian friendly with facilities and services required (Burton, 2006). Comfort is a quality of a successful street and a measure of a good street (Carr et al, 1992; Jacobs, 1999: PPS, 2001; Carmona et al, 2003). Carmona et al (2003) argued that the quality of comfort is associated with environmental factors, physical comfort and social and psychological comfort.

Environmental condition

Environmental conditions have very strong relationship with people behaviour and the usage of outdoor spaces (Nikolopoulou et al, 2001). Urban designers must have good understanding of the influence of climate on urban settlement. As according to Nikolopoulou (2001), the building that self-shading the streets and protect the surrounding spaces from hot sun or dispersed buildings to allow wind flow through the spaces in hot humid climates as well as other problems created by adapting others architectural vocabulary without considering the suitability of the local climate is currently have to take into account.

In a hot and humid country like Malaysia (refer to chapter 5), environmental factors are the main attributes to achieve comfort. Environmental conditions in public spaces and around buildings, such as microclimate, sunlight, shelter, air movement about buildings and lighting, play a vital role in creating a comfortable space. The findings in a Mediterranean urban area confirm that there is a strong relationship between microclimate conditions and use of open spaces (Nikolopoulou et al 2007). Lynch (1981) noted that streets that are cooler, shadier and pleasant to be on are settings for activities that can bring people together. In order to create comfortable street/space, the design decisions play an important role in modifying the impact of microclimate (Carmona et al., 2003; Mofidi, 2009). The pattern of physical layout natural and artificial, such as the positioning of access and pedestrian paths, trees and other vegetation, walls, fences and other obstructions; the orientation of internal and external spaces and facades with respect to the direction of sunlight and shade; massing, grouping, and space between buildings; the wind environment; the positioning of main entrances and other openings acting as transitions between inside and outside conditions; the usage of planting, water elements to enhance natural cooling; and environmental noise and pollution are the factors that affect the microclimate in streets (Lang, 1994;Carmona et al., 2003).

Relief from the sun or access to sun is also a main factor in measuring the level of comfort in urban space. Hence, it can also affect the use of space in urban areas (Carr et al., 1992, Whyte, 1980). The observation of the use of space proved that air temperature and solar radiation are the most vital parameters in relation to the use of space, with wind speed and relative humidity having a weak effect (Nikolopoulou et al., 2007). However, in the case of Malaysia, according to Abdul Rahman (2004), relative humidity does affect users' feeling of comfort. Jacobs (1996) added that the best street is the street that can provide sufficient protection from the elements without trying to negate the natural environment. In Malaysia, which is a hot humid country, people try to avoid direct access to the sun. Shelter from the sun and rain is a vital factor for pedestrians in hot countries like Malaysia.

Protection from the wind and good ventilation are also important factors that can give comfort to the people in open spaces (Rapoport, 1990; Jacobs, 1996). Wind flow has a substantial effect on the comfort of pedestrians, the environmental conditions within public spaces and around building entrances, and the activities that might occur there (Carmona et al., 2003). Gently winding streets are more comfortable to walk along; feel less time-consuming even if it actually takes the same time (Burton et al., 2006). However, in Malaysia, external spaces need to be designed to encourage a greater through flow of cooling air, the orientation of buildings, walls, trees and other elements around the space can affect the air movement and ventilation in urban spaces. The use of water elements in landscape features such as water features and fountains can help cooling through the evaporation of water vapour.

The relationship between building height and street width is also considered to be the main contributor to the heat island effect in cities (Todhunter 1990 in Bourbia et al., 2009). One can observe that, with few exceptions, the larger the sky view factor, the higher the air temperature registered. The higher the height/width ratio, the lower the temperature recorded for either air or surface (Bourbia et al., 2009). They suggested that the more open and exposed nature of an urban street could result in an increase in daytime air temperature within the canyon. This effect can be reduced by controlling the sky view factor and inclusion of vegetation. Shade trees reduce heat gain directly by shading and also by transpiration. Adding vegetation into the environment, planting trees, incorporating vegetation onto roofs can mitigate UHI (urban heat island), reduce the energy used and improve air quality. The findings confirm a strong relationship between microclimatic and comfort conditions, with air temperature and solar radiation being important determinants of comfort (Nikolopoulou et al., 2006; Eliassaon et al., 2007).

The results of this study show that weather and microclimate have a significant influence on two (functionality and psychological) of the three components constituting a place. Weather and climate influence the physical components of a place, while building orientation, shape, material and colours affect temperature, wind and other parameters, to produce a site specific microclimate. Further discussion on the importance of these attributes within a Malaysian climatic context will be discussed in the analysis chapters.

Surface materials

Many features of the physical structures of the city including the surface materials can affect the urban climate that gives comfort environments to the street (Mofidi, 2009). Bourbia et al. (2009), open spaces in cities have a large variety of forms and surface characteristics. They stressed that the microclimate of these spaces is influenced by several parameters, such as the urban geometry, the vegetation, the water levels and the properties of surfaces (Boubia et al. (2009). The inappropriate use of these parameters cited above contributes to the harshness of the environment and makes the temperature in the urban environment higher than in the suburbs. The diversity of the sky view factor (SVF) and the street orientation have an effect on the street microclimate (Bourbia et al., 2009). Bourbia et al. (2009), in their research, a comparison between the weather station (open site) and the average temperature measured at the selected site, confirm that the open site field temperatures are lower than the urban areas, especially during night time, with a difference ranging between 3 and 6 degrees Celsius. They found that the difference in temperature is mainly caused by the nature of the surfaces covering the studied site, water resistance surfaces and non-existence of vegetation. These surfaces tend to have high heat capacities and are thus efficient at absorbing and reradiating the sun's energy water later (Bourbia et al. 2009).

Lack of crowding

As walking is the first and foremost type of transportation and also a way to get around, this activity needs space to be able to walk freely without being disturbed (Gehl, 1987). Lynch (1981) stressed that if there are many people there should not be so many as to make it difficult or uncomfortable to walk. The number of users on the street (crowding) affect the sense of comfort on the street. *"Crowding is the psychological or subjective experience that results from a recognition that has less space than one desires"* (Krupart, 1984, p. 100). Crowding occurs when a space normally occupied by fewer people has an increased number of people or when a number of people share a small space (Krupart, 1984). The sense of crowding in space is different from one another. Rapoport (1977) argued that the feeling of crowding (square feet per person) for people in the United

States is different compared to people in Hong Kong. Therefore, in order to study the feeling of crowding for people, one has to go to actually experience the people in their context. A street never seems crowded with 3-4 people per minute per metre. Crowding starts at perhaps 13 people per minute per metre (Jacobs, 1996). Jacobs (1996) added that the streets might seem empty when the people are under 2 per minute per metre. Based on interviews, the problems associated with the physiological needs in Shirazi Street, Iran, found that in-appropriate surface sidewalks and narrow sidewalks also affect the comfort of space (Abbaszadeh et al, 2007).

Crowding is not only caused by people but also by traffic on the road. The street environment should not be subject to noticeable noise or vibration from traffic. Street users should be able to talk on the sidewalks in normal conversational tones without having to shout. They should not be forced to withdraw from the street because of the discomfort caused by traffic. According to Krupart (1985), noise is unwanted sound that is sometimes distracting and can interfere with ongoing activities that sometimes cause psychological harm to the users. The street environment should have places where people can sit, converse and play (Appleyard, 1983).

Segregation between pedestrians and vehicles on the street is also another physical factor that can reduce sense of crowding and creates a sense of comfort and pleasure to the street users in the streets. Curbs and sidewalks are the most common ways of separating and thereby protecting pedestrians from vehicles (Jacobs, 1996). They may be physically separate but do not necessarily offer a sense of safety or calmness. Trees added at a curb line, if close to each other, create a pedestrian zone in which pedestrians feel safe. No physical separation at all between vehicles and pedestrian paths, that is, no curbs, can be a better solution, particularly on crowded and small streets; let cars and people mix (Jacobs, 1996).

As discussed above the level of crowding varies among the groups of users. It may well be that the number of people and cars on the street that were considered crowded in previous studies are not considered crowded to the street users in Kuala Lumpur or vice versa.

Street facilities (Seating/ shelter/ toilets/ kiosk)

There are streets that we avoid because the streets are physically uncomfortable (Rapoport, 1990; Carr et al., 1992; Carmona et al., 2003). Public seating, shelters, toilets, kiosks and other public facilities are the elements that contribute to physical comfort in

urban public places like streets. Comfortable and sufficient seating is an in important aspect of nearly any successful urban space. According to Carr et al. (1992, p.94), "*the feature of physically comfortable seating include the orientation of the seating, its proximity to areas of access, seating that is moveable, seating for individuals and groups, seating that enables reading, eating, talking, resting and privacy, seats with back, and, in the case of adults with children, seating in the sight line of play areas*". In addition to physical comfort seating should be designed so as to offer social and physical comfort. Alexander et al. (1977) argued that people in outdoor spaces always try to find a spot where they can have their back protected, looking towards some larger opening, beyond the space immediately in front of them. People do not sit facing brick walls but they place themselves towards the view or towards whatever there is in the distance that comes nearest to a view (Alexander et al., 1977; Whyte, 1980). In short, it means that in any urban space where the users feel comfortable has a back and a view into a larger space. Whyte in *The Social Life of small urban spaces* (1980) stressed that a 'sittable space', is a spaces that has access to sunlight, trees, water, and food among other amenities. In stressing this point, Whyte (1980) stated that it is particularly related to choice: 'sitting upfront, the back side, in the sun, in the shade, in groups, off alone' (Whyte, 1980: p 28). Madden and Bussard, in Carr et al. (1992), stated that the people they studied preferred to be seated facing the pedestrian flow and avoided sitting where their backs were turned to all or part of pedestrian flows. Gehl (1987) argued that based on their investigation, the most used seating in the urban space are along the main path, with a view of the most trafficked pedestrians routes. People tend to sit where there are places to sit such as ledges or steps (Whyte, 1980). Oxley (2002), in Burton et al. (2006), suggested that seating should be both 420mm to 440mm and 470mm to 480 mm in height. Seating should be every 100-125 m.

Seating materials and bus shelters at bus stops also help to provide a comfortable street. Seats must be made from materials that do not conduct heat or cold (Burton et al., 2006). Bus shelters are an enclosed shelter with transparent walls or large clear windows, protected from rain and wind while enabling them to see buses coming. The transparency also makes the user feel safer as they can see who is in the shelter, can be seen by passers-by while they are waiting. However, some of the street furniture is installed purposely to discourage certain behaviour. In some cases, spiked metal bars are purposely put to avoid people from sitting on ledges; seating or benches with multiple armrests prevent people from lying down, and also sprinkler systems can course 'undesirables' at random moments (Van Melik et al., 2007).

Another kind of comfort that is usually ignored and neglected in the urban space in many countries is the availability of services such as toilets, shops, public telephones, kiosks, cafes and food (Carr et al., 1992; Rapoport, 1990). The presence and availability of these services can increase the level of comfort and convenience of the space and affect the maximum use of the space (Rapoport, 1990). In addition, the presences of these facilities are important factors in making a street welcoming and easy to use for people of all ages and capabilities (Burton et al, 2006).

Due to the importance of the street facilities to the users, in Malaysia, over RM 11.0 million (USD 2.8 million) was allocated for the re-construction, re-development and provision of new pedestrian facilities in the year 1998 (Kuala Lumpur City Hall, 1999) in Talha et al. (2004). According to Talha et al. (2004), these efforts gave new hope to the street users and they could be seen walking everywhere conveniently.

Psychological comfort

Social and psychological comfort is more related to the character and ambiance of the street (Carmona et al., 2003). According to Carr et al. (1992), a sense of psychological comfort may be a prerequisite of relaxation. Whyte (1980) demonstrated that people in urban spaces are looking for liveliness and some form of engagement with the life of the city, rather than retreating from it. In urban spaces factors that contribute for relaxation are natural elements (Carmona et al., 2003). Trees and greenery in urban spaces are major elements in an urban setting that give 'relaxation' to their user; they not only create physiological comfort but also physical comfort to people. Other natural elements that contribute to 'relaxation' are water (water features, fountain, waterfall, fish pond, etc.). Based on studies in Green Acre Park, New York, the element that most contributes to the sense of relaxation and retreat is the dramatic waterfall that dominates the site visually and aurally (Carr et al, 1992). Users stressed that the water element also cools them off on a hot day. Davies in Burton (2006) recommends that *'The best public spaces often have nodes of activity, compliment by quiet zones for rest and people watching' (p. 99).* Relaxation is identified as one of five primary needs in public space (Carr et al, 1992).

The quality of convenience is the basic physiological need for people that bring to cosier, comfort and help to attract more users to the space. Convenience refers to the minimal commitments to enter and use the space (Rivlin, 1994). Rivlin (1994), Jacobs (1996) and Lynch 1981) stressed that convenience is a vital quality that the space must have in order to attract people to use the space. This is because according to Carr et al. (1992), many

urban spaces today have been designed to encourage people to look at but not to use. Rivlin (1994) noted that the main factor that contributes convenience to a space is its location, which can make people's lives more easy and casual manner.

In this discussion, the attributes that contributes to psychological comfort are mostly based on the authors from western countries. However, it is still needs to be evaluated for Kuala Lumpur street to ascertain the relevance of the attributes in Malaysia context.

3.3.2 Safety and security

Perception of safety is a common concern and a reality in all urban spaces that cannot be denied as one of the factors in comfort. According to Burton, (2006), safety is an essential characteristic of streets for life. Safety means people being able to walk, work and live without fear day and night; not being afraid of the strangers one meets on the street; walking alone and feeling at ease; no fear of crime; a feeling of security; and individuals feel comfortable within an eclectic mix of different physical designs and social interactions (Talha, 2008). Safety refers to streets that enable people to use, enjoy and move around the outside environment without fear of tripping or falling, being run-over or being attacked (Jacobs, 1961). It can be related to crime, terrorism, fast moving vehicles, air pollution, water contamination, etc. (Rapoport, 1990; Carmona et al., 2003). However, in respect of streets, based on previous scholars, safety mostly relates to crime and traffic safety.

Different groups of people have different levels of feeling safe in an urban street. Much of the literature show that, across many cultures and time, women, children, older groups of people and people with disability were the groups that have most concerns and have been threatened in public spaces, which makes them feel less safe and comfortable to use the space. Therefore, in this research the variations between different groups of streets user are identified. The significance of the attribute and elements that contributes to safety to the users in Malaysia context will be evaluated in a later chapter.

Fear of traffic/accidents

Nowadays, pedestrian safety issues are one of the most concerns in most of the urban streets in the world. It is considered as a serious traffic safety issue nationwide and is not confined to urban areas. There is a tremendous need to improve safety for pedestrians in

urban areas, as a means of improving the liveable conditions of public space. The amount of vehicular traffic, which has increased beyond expectations, means that the streets are dominated by the car. In many locations there are few people using the streets as a pedestrian resource, which causes the loss of natural surveillance of the streets (Jacobs, 1961). To explore this aspect in more detail, the following environmental and exposure factors are considered: population density, type of pedestrian crossing, traffic control used at the crossing, surrounding land use type, highway facility type, vehicle travel speed, vehicle volume and pedestrian volume (Sisiopiku et al., 2003).

The pedestrian and traffic segregation strategy has improved the traffic movement and has led to an improvement in pedestrian safety as well (Talha, 2008). However, the Design for Pedestrian Friendly (urban design compendium), argued that people will love to use the street if the street is designed for low speeds and the users of the street (pedestrian and vehicles) can mix safely. They identify five principles (five C's) to encourage walking on urban streets; connections (connect the places to where pedestrians want to go); convenience (the routes are direct and the crossings provided are usable and easy to use); convivial (variety, well lit and safe); comfortable (the width and quality of the pedestrian walkway is good and no clutter along the street); and conspicuousness (easy to use and follow the route with good maintenance and surface treatment and good signage for pedestrian guidance) (Davies, 2000).

Ground level signal controlled pedestrian crossings should be provided particularly on busier and wider roads. Audible signals should be at a fairly low pitch so that people with hearing impairments can hear them and there should also always be a visual signal (Burton, 2006). Footways should be at least 2 m wide to allow people with mobility problems and wheelchair users to safely pass oncoming pedestrians. The safest paving to walk on is plain, smooth, level, non-slip, and non-reflective. Grates and drain should be flush with paving with openings smaller than a walking stick or shoe heel size. Footways should also be clear of any unnecessary clutter.

In the Urban Design Compendium (Davies, 2000), it was stressed that for streets between 500 and 1,000 vehicles per hour (two-way), the street needs to provide specific pedestrian crossings to all allow the users to cross. In this compendium they also added that for main roads, wide crossings are required with well-defined crossings, with suitable floorscape, lights and other devices. Papaionnou et al. (2007), in their research, found that the main reason pedestrians feel unsafe is driver behaviour and that they may not cross the road in time. Many people older than 50 years do not feel confident when

crossing a road. The age group 66-80 feels more unsafe than other groups. Users, who need help in order to move, feel unsafe due to driver's behaviour (high speeds and parked cars) and due to bad quality road infrastructure. Women more often use pedestrian crossings than men. The main reason for not using pedestrian crossings is to save time. In terms of the pedestrian environment, the majority of the pedestrians stated that they are not satisfied with the walking environment. Pedestrian-friendly crossing distances–pedestrian refuge provides a place for people to wait if they are not fast enough to cross during one signal cycle. The wider the street, the longer it will take to cross of course, so the longer a pedestrian will be exposed to vehicular traffic. According to the Traffic signal standards, which are governed by the Manual for Uniform Traffic Control Devices (MUTCD) DEC 2009, the new standard for signal timing now assumes a walking speed of 3.5 ft/sec. The American with Disabilities Act standard notes that people who are older or otherwise impaired can often only manage 1.5feet/second.

In the context of Malaysian street, Malaysian Standard 1331 (2003) has came out the code of practices for busy shopping areas where at this particular location such as busy shopping areas and where the number of heavy vehicles exceed 300 per hour pedestrian crossing should be provided. Hence, pelican crossing (pedestrian activated traffic light crossing) are much preferred for elderly and disabled person for that named area (Malaysian Standard 1331, 2003).

The pedestrian and traffic segregation strategy has improved the traffic movement and has led to an improvement in pedestrian safety as well (Talha, 2008). The segregation of pedestrian routes such as alleyways can be a useful means of connecting other routes, however, if they are lined by blank walls or fencing or go through places that are seldom used people will feel vulnerable and unwilling to use them (Burton, 2006). Therefore, segregated pedestrian routes should be very short, should connect to busier streets and be overlooked by windows and doors.

Fear of crime

Much of the literature about urban space concerns the public's sense of fear and also the method used to overcome this perception (Carmona et al., 2003; Cybriwsky, 1999). Rivlin (1994) stressed that safety is an essential quality of public place and is especially salient to people in urban areas. Many public places, especially the residual space gives the perception of unsafe to the users. For example, the design of space that locates spaces away from the street level, such as sunken plazas or roof top urban spaces is not convincing in terms of safety (Whyte, 1980). Therefore, natural surveillance, such as

buildings facing the street helps to provide a visually interesting street frontage and a clear distinction between public and private space (Burton et al, 2006). It also helps to make people walking along the street feel safer because it is reassuring to feel that the street can be seen by the occupants of the buildings. *'Crowded streets and neighbours' eyes produce a sense of belonging and turn cities into stages, where informal surveillance makes public space safe for more vulnerable'* (Ruggiero,2001,p.22) . This supports with Nasar et al (1983), in their studied regards to emotional quality of the urban scene which found that scenes with open views were perceived to be safer than scenes with closed views. Hence, physical attributes that portray sense of enclosure can contributes to feeling of fear (Nasar et al, 1993).

The inclusion of trees and other streetscape features enhances the aesthetic quality of a roadway; however, there is substantive disagreement about their safety effects (Dumbaugh, 2005). The drawbacks to pedestrianization it is claimed occur at night when pedestrianized areas become completely deserted; previously car traffic had been an important contribution to a feeling of passing surveillance and safety. Separation of the pedestrian way from vehicular traffic, as in the case of a pedestrian mall can also contribute to ease and relaxed movement. However, the features that make a pleasant place may increase people's concern about safety during low use times (Carr et al., 1996, Carmona et al., 2003). Jane Jacobs (1961) points out that empty street can lead to the public domain being donated to the thug, mugger and rapist. In the design of the street a proper balance is required between privacy, defensible space, access for the car and safe pedestrian usage of the street (Moughtin, 1992). Appleyard et al. (1972) suggested that for the streets where traffic flow and speeds could not be reduced, sidewalk protection by trees, low walls and hedges is needed, the provision of alternative spaces to divert children activities away from dangerous streets, and the protection of residences from glaring street lights.

Van Melik et al. (2007) argued that the high anxiety of crime induces people to avoid the public domain of the city and retreat into a private sphere. They also argued that the design and management of public space must respond to two aspects- the fear and fantasy - in order to control the public space (Van Melik et al., 2007). Secured public space in many Western cities is characterized by measures to generate a 'sense of safety', such as the installation of CCTV (Closed –Circuit Television) and the enforcement of restrictive local ordinances. However, according to (Lofland, 1998) in Malek et al.(2007), there are two instruments to make public spaces safer, one is direct instruments; supervision by police, security guards or by CCTV, and the second is

indirect measures, which are grounded in the architectural and urban design involving changes in physical design that generally serve as restraints against loitering. However, as public spaces become safer and provide more entertainment, they are also being homogenized. This is caused by consumer preferences rather than citizens' rights (Van Melik et al., 2007).

Public safety on streets depends primarily on the intensity of use, which, for this purpose, is probably more important than the physical form of the street. Streets are safer if heavily used and if overlooked by occupants of surrounding buildings (Moughtin et al., 1999). Tiesdell et al. (1998) stated that the public user not only frightened by criminal acts in urban space but also by the anti social behaviours (undesirables) .Whyte (1980) and Carr et al.(1992) pointed out that 'undesirables', including people such as bag women, drug dealers, muggers, winos and people who act strangely in urban spaces, affect the 'sense of safety'. According to Jacobs (1961,p.40) – *'the first thing to understand is that public peace –the sidewalk and the street peace – of cities is not kept primarily by the police, it is kept primarily by an intricate, almost unconscious, network of voluntary control and standards amongst the people themselves and enforced by the people themselves'* .

Good design and effective use of the built environment can assist in reducing the opportunity for crime as well as the fear of crime and perceptions of safety (Talha, 2008). She stressed that the councils must ensure that public spaces are well designed and maintained and that safety issues are the key concept in the design of the public realm (Talha, 2008). CPETD (Crime prevention through environmental design) consists of three design approaches; the first approach is natural surveillance, for example, placing windows in locations that allow intended users to see or to be seen while ensuring intruders will see as well. This is enhanced by adequate lighting and landscaping that allows unobstructed views. Second, is natural access control - using doors, shrubs, fences and other physical elements to discourage access to an area by all but its intended users; and, finally, territorial behaviour where the sidewalk, landscaping and other elements establish the boundaries between pedestrians and automobiles (Talha, 2008).

Fear of dark

People are afraid of the dark, and it has been proved that night street crimes are most prevalent in places where there are too few pedestrians to provide natural surveillance (Shahriah et al., 2004). Dark and isolated night spots invite crime (Alexander et al., 1977). Better lighting always comes high on the list of women's priorities for making town

centres feel safer and themselves more secure (Warpole, 1992). Flemming (1987) argued that what we do know for certain is that in most major towns and cities in Europe 42% of all night-time street crime takes place when lighting levels are at 5 lux, or, further, 32% of night-time crime is committed between lighting levels of 5 lux and 10 lux, whereas only 3% of these crimes take place where the level of lighting is about 20 lux (Warpole, 1992). People aged 40 years old need twice as much light as 20 year olds and people over the age of 60 years need three to five times more light to achieve the same visual acuity (AIA, 1985; Brawley, 2001; Campbell, 2005). Declining visual acuity creates difficulties in seeing what is ahead, seeing things to the side, reading small print and distinguishing fine detail or faces, especially for the elderly group (Burton et al., 2006).

Kim et al.(2006), in their research on criteria for street lighting design, argued that the outdoor lighting should support the design concept of the area and building, provide orientation, and be comfortable. He stressed that, especially for street lighting, quantitative aspects of light such as recommended illuminance, luminance, and associated uniformity should be verified and applied for both vehicles and pedestrians. Hence, the illumination is also able to enhance the safety of people and security of property. Previous studies in the Korea context showed that crime and other deviant behaviour were diminished in well-illuminated places (Kim et al., 2006) (See table 3.2)

Classification	Recommended illuminance (lx)
Commercial area	30-100
Intermediate street	10-30
Residential area	3-10

Table 3.2: Recommended illuminance level for outdoors according to Korea Standards (Source, Kim et al., 2006)

3.3.3 Accessibility/linkages

Accessibility is also the essential quality that the street must have and it is a basic performance dimension of urban space and the people that use it (Lynch, 1981; Jacobs, 1996; Carr et al., 1992; Making Places Newsletter, 2005). Accessibility means streets that enable the users to reach, enter, use and walk around places they want to go; accessible streets have local services and facilities, are connected to each other (persons, services, resources, activities, information of places), have wide, flat footways and ground level signal controlled pedestrian crossings (Lynch, 1981; Burton, 2006). The Making Place Newsletter (2005) suggested that the street must be easy to get to,

accessible by foot, the surrounding streets are narrow, crosswalks are well marked, lights are timed for pedestrians, traffic moves slowly and transit stops are located nearby. Carr et al. (1992) noted that there are three components of access: physical access, visual access and symbolic access.

Whyte (1980) argued that for a space to be physically accessible the space should be without barriers to entry, it should be well connected to paths of circulation. He also added that the connection of a space to adjacent sidewalks is an important aspect of this access (Whyte, 1980). Appleyard, in Carr et al. (1992), points out that path direction, vertical features, surface changes, planting and street furniture are all designed to create physical barriers in space. However, the importance of physical barriers in safety control is undeniable. In streets, accessibility and proximity to facilities provided along the street is also important to encourage the use of the street. According to Danish principles in Deichmann (2004), it is suggested that the main principles of accessible street design include even surfaces for a width of at least 1.5 metre, gradients of a maximum of 1 in 20 and 1 in 40 across, kerbs lowered to a height of 3cms at all crossings (rational - a lower kerb cannot be detected by a blind person's cane while a higher kerb cannot be crossed in a wheel chair), tactile guidelines and warnings for blind people, sufficient and correctly sized parking spaces reserved for disabled people and high kerbs to allow easy entering and exiting. However, according to Burton et al., (2006), the footways must be at least 2 metres wide to allow people with mobility problems and wheelchair users to safely pass oncoming pedestrians and give people a chance to walk further away from the motor traffic travelling alongside on the road (Burton et al., 2006). Another factor of street that is important for creating accessibility is avoidable changes in level (Burton et al., 2006) Burton et al. (2006) noted that gentle slopes and ramps are easier for older people to see and negotiate than small steps and are necessary for people with wheelchairs, walking frames, pushchairs and shopping trolleys. However, to make it accessible both steps and ramps should be provided.

Visual access or visibility is important in order for the public user to feel free to enter a space. In fact, clear visibility is important for safety within the space (Carr et al., 1992). They also pointed out that three-foot high walls and planting surrounding urban space can obstruct the people passing by to see into the space and to enter the space (Carr et al., 1992).

Symbolic access is the access that involves the presence of cues, in the form of people or design elements. The presence of food stalls, shops and vendors may cue the

'publicness' of the place (Carr et al., 1992). Fit refers to how well it's spatial and temporal pattern matches the behaviour of its inhabitants. This, according to Lynch, relates to the match between action and form in its behavioural settings and behavioural circuits (whole pattern of behaviour) and it is intimately dependent on culture (Lynch, 1981). "Places are modified to fit ways of behaving, and behaviours are changed to fit a given place" (Lynch, 1981). Fit deals with place and actual behaviour, or, at most, behaviour consciously desired (Lynch, 1981). However, Lynch (1981) argued that fit is intimately dependent on culture, expectation, norms and the customary way of doing things.

Proximity and connectivity

Proximity, directness and good connections (continuity) are the factors that also contribute to accessibility to the street and urban spaces. Proximity in this research is related with comfortable commute distance and time from the user's place (origin) to their destination. In Burton et al. (2006), the UK Government states that 10 min is a comfortable walking time to reach services and facilities and calculates that this is the time it takes to walk about 800m (Department of Transport, Local Government and the Regions (DTLR), 2001). Llewelyn-Davies (2000), in Burton (2006), suggests that local shops, bus stops and other facilities should be situated within a 10 min (800m) walking distance. The calculation appears to be based on younger adults as people in their mid-70's will generally take around 10-20 min to walk 400-500 m and cannot walk further than 10 min without a rest (American Institute of Architects (AIA), 1985; Carstens, 1985).

Carney (2000) stated that pedestrian comfort depends on *'directness', and 'continuity' of* the street. Connectivity is defined here as the degree to which the habitat for a species is continuous or traversable across a spatial extent. There are two aspects of connectivity, the continuity of a certain habitat (structural connectivity) and the possibility for organisms to move within or between patches (functional connectivity) (Anderson, 2006). The effective distance between patches is a result of landscape permeability (i.e., how suitable a habitat is or how permeable it is to movement). Burton et al. (2006) suggested that aspects and factors of the outdoor environment, such as street layout that physically connect to each other, have clear views along them and that simple junctions help to create accessibility.

Legibility/directions

Legible streets have an easy to understand network of routes and junctions with simple, explicit signs and visible, unambiguous features, easy to understand where they are and to identify which way they need to go (Burton et al., 2006). Signs for older people are

plain and simple and provide explicit, essential information only (Burton, 2006). They should have large, no stylised dark lettering on a light background and symbols should be realistic and unambiguous. Signs should also have non-glare lighting and non-reflective coverings. Signs giving directions should preferably be on a post and single pointers and positioned at important way finding decision points, such as road junctions and crossings (Burton, 2006). Signs identifying the location of a place or building are most effective when perpendicular to the wall as they can be seen from a distance. However, if there are too many on one street it would be confusing. Signs fixed to walls are better than on freestanding poles, as it helps to reduce street clutter. According to Burton (2006), suggest the streets that most legible to people especially the older; the irregular grid creates a more interesting overall street pattern, provide direct, connected routes which are easy to understand and gives people a clearer view ahead than the 90% turns and blind bends created by uniform grids. It also means that forked, staggered and T-junctions can be used, rather than crossroads. Street blocks should be of varying short lengths from around (60-100m) to allow for variety. Longer streets should be gently winding to break up the length and to provide a slowly emerging view as people walk along. Streets should also, preferably, be relatively narrow to help maintain concentration (Burton, 2006).

Distinctiveness/image

Distinctive streets give a clear image of where they are, what their uses are and where they lead ,reflect the local character of the area and have a variety of uses, built form, features, colours and materials that give the streets and buildings their own identity within the overall character of the neighbourhood (Burton, 2006). Places and open spaces need to provide distinctive cues to their identity so that it is clear what they are used for and whether they are public or private. Urban squares and green spaces should be small and informal with plenty of activity, delineated footpaths and a variety of features, such as seating, trees and other soft landscaping (Burton, 2006). According to Llewelyn-Davies (2000) in Burton et al. 2006) people of all ages do not always simply choose the most obvious route to reach their destination; they are also influenced by how interesting or dull each route is. Historic buildings- civic buildings, distinctive structures (such as high-rise building, towers), places of activity; and unusual places, buildings or usages are more likely to be easy to remember and also catch the eye and help people to identify which way to go. Moore (1991), in Burton et al. (2006), found that environmental cues are first recognised in terms of their function, followed by their location and then their architectural style or character. Aesthetic features, such as fountains, trees and flower

tubs, are used on the accompanied walks to identify the direction one is going in and the location of the destination.

Walkability

Walkability is a frequently employed index of the quality of the urban environments. A street must be walkable, and connect buildings and activities across the street (Carmona et al., 2003). According to Cervero and Kockelman (1997), through user-friendly design in open spaces can stimulate walking behaviours among peoples and reduce the number of motor vehicle kilometres driven per people. Based on previous authors, walkability is determined by several key factors such as safety, building density, land mix use, street connectivity and aesthetics. Through walking, people will participate in many social and economic activities. Suitable facilities on the street must meet the needs (physiologically, psychological and social) and understand the characteristics of pedestrians' movement to encourage walking for different purposes of street (A - Azzami, 2004). He also added that by ensuring the pedestrians are free from interference from other road users, accidents and crowding can also encourage walking activity on the street. Plowden (2001) argued that for people to be able and willing to walk and spend time in city streets, they need three things. First, shops, schools, parks, offices and public buildings must be within reasonable walking distance. Second, the street environment must be 'attractive' in the broadest sense. This means well designed, not dominated by motor traffic, accessible, clean safe and beautiful. The third thing that people need to encourage them to walk is the desire or motivation to walk. Providing a functional and attractive environment is not enough.

The urban designers also need to know what is happening in the people's minds; such as the criteria that encourage and discourage them from doing so: are they concerned about the weather, personal security, or the time it takes to travel on foot. A good street must be functional and attractive (Plowden, 2001). According to Plowden (2001), in creating a living street, the street should be redesigned to reflect its role as place for people as well as traffic. Roads should be re allocated to make sure pedestrians do not have to huddle on crowded pavements. Crossing the road should be made easier and safer. Barriers and obstacles should be removed. Street signs and maps should tell pedestrians where they are and how to reach their destination on foot.

3.4 The theoretical framework based on the user-friendly street theory of urban design

Based on the literature, the conceptual framework for the study is derived (see figure 3.1). The factors and attributes that belong to the physical, functional and social dimensions are important to achieve a user-friendly street in an urban area. The results of the friendly street can be known through the relationship between the physical and functional aspects on the street and also through the human response. Therefore, the interrelations between all these aspects are important to achieve a user-friendly street.

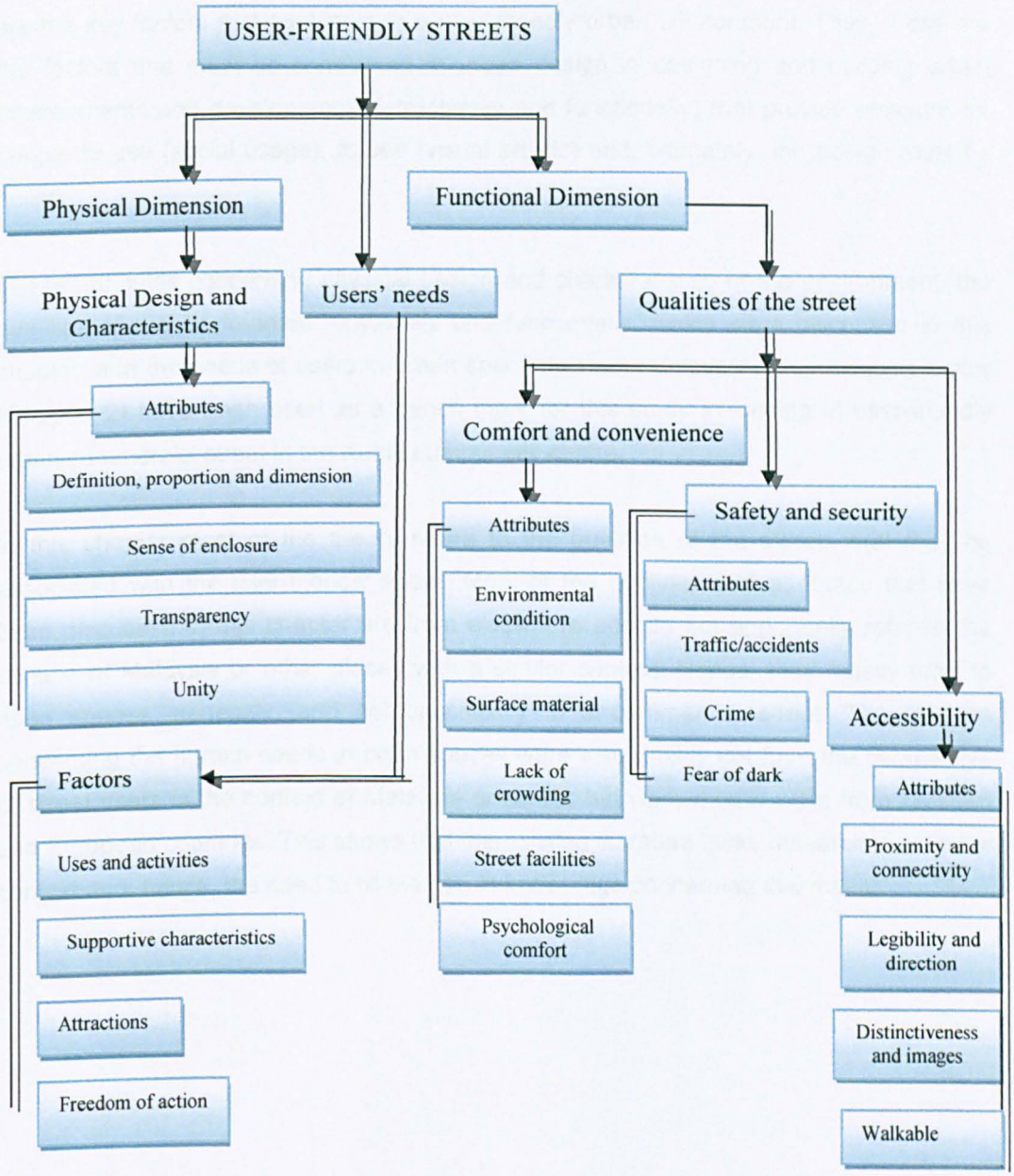


Figure 3.1: Conceptual framework for the study of user-friendly urban-commercial street

3.5 Conclusion

The main purpose of this chapter is to review the literature concerning the concept of a user-friendly street, the physical design and characteristics of a street that contribute to a friendly urban commercial street, the qualities of a user-friendly street that based on previous studies and to gather all the earlier discussions to develop the theoretical framework for this research. Based on previous discussion it was found that there is no significant difference between the concept of user-friendly between a street and other urban spaces. The attributes that comprise the physical, functional and social dimensions are the key factors that contribute to a user-friendly urban environment. Thus, these are the factors that must be considered in urban design in designing and building urban environments and developments (structurally and functionally) that provide pleasure for people to use (social usage), to see (visual artistic) and, ultimately, the design must be holistic.

These attributes concerning physical design and characteristics of the environment, the qualities of the environment physically and functionally, which were discussed in this chapter, and the needs of users in urban space that were discussed in previous chapter (Chapter 2) have been used as a bench mark for this study in looking at user-friendly urban commercial street in the Kuala Lumpur city centre.

In this chapter most of the theory refers to the qualities of the streets that may be associated with the user-friendly street. Most of the qualities and attributes that have been discussed in this chapter are from elsewhere and do not specifically refer to the context of Malaysia or other places with a similar context. Hence, they mostly refer to open spaces, generally, and not specifically to a commercial street. The theories concerning the human needs in open spaces were also mostly not from the perspective of street users in the context of Malaysia or similar but were mostly were from Western and European countries. This shows that the existing literature lacks research in a similar context and, hence, the need to fill the gap in knowledge concerning this matter.

CHAPTER FOUR

RESEARCH DESIGN AND METHODOLOGY

4.0 Introduction

This chapter concentrates on the form and the methodology used in this study. This chapter is going to be a vital part of the research and explains in detail the research design, and methodology for appropriate strategies to collect the data needed in order to answer the research question of this research. The right methodology of collecting data will determine the validity and reliability of the findings that are derived from the analysis of the data (Shamsuddin, 1997). This chapter reviews the literature in combination with considering the specific requirements of the research to select the methodological approach for this research.

This chapter is divided into four (4) sections. The first section discusses the approach of the methodology, the scope and research processes, which determine the appropriate research process and the research investigation structure. The second section reviews the previous methodology and approaches relevant to the research as a guide in determining the research methods and procedures. The third section discusses the research method and data collection techniques employed in this research study followed by the conclusion.

4.1 The Methodology Approach

It has been proven by the previous research, as well as emphasized by Creswell (2007) in this field, that the approach to the research can be undertaken quantitatively or qualitatively (Bryman, 1995; Cresswell, 2007). According to Bianchi and Landry in Wan Abdullah (2007), quantitative data are important because they tell you what exists but they have to be complimented by qualitative data. Whereas, the qualitative data is relevant for explaining why and how something exists and how it changes over time. Based on previous research in similar areas that relate to environmental and behavioural research, a combination of methods was used in order to seek the multi-dimensional aspects (Lynch, 1960; Shamsuddin, 1996; Mijan, 2000; Papaionnou et al., 2007; Ujang, 2008; Wan Ismail, 2009; Janson, 2010).

The choice of methodology for this research is governed by two factors. The methodology for this research is governed by the methodology adopted by previous research and also the background of the research and research questions. According to Ovstedal et al. (2004), when planning urban space and pedestrian infrastructure, it is important to bear in mind the user's point of view. They added that several methods can be used to collect data about different user group's preferences, experiences and views. Hence, using multiple research techniques to study a problem can increase reliability and decrease the chance of falsely constant results (Zeisel, 1984).

In this research, the mixed methodology model (Creswell, 2007) has been used to identify the reasons that make a street user-friendly, to examine the attributes and characteristics of the street that make a street friendly to users and to determine the similarities and differences of a friendly street from different types of user and different socio- demographic backgrounds. The user's needs and perception of user-friendly street is influenced by many factors and can be proven by using more than a single source of evidence and inter related aspects. Therefore, this research relies on multiple sources of evidence and data will be converged through the triangulation method. As Gillham (2000) added, this multi- method approach is known as triangulation. The different methods have different strengths and weaknesses (Gillham, 2000). Therefore, this method is used based on the assumption that bias will be neutralised when the sources and methods are triangulated (Ujang, 2008). The use of triangulation in this research is to ensure that the conclusions drawn are from the convergence of many resources that can reduce the bias of the samples (Creswell, 2007).

In this research, a single study area is chosen as a case study. However, different sources of data, different types of user and socio cultural groups were investigated in this study to reveal more variables of inter-related interest. Jalan Tunku Abdul Rahman is selected as the study area to represent urban commercial streets in Kuala Lumpur city centre taking into consideration the significance of street characteristics in terms of physical, functional and socio cultural. The details of why a single case study and case study selection will be explained in Section 4.5.1 (The case study and selection criteria) and Chapter 5 (Case Study Chapter)

4.2 Scope of Research

This research seeks to answer questions relating to elements and qualities that users associate with a user-friendly urban commercial street. It also attempts to discover if

there are any similarities and differences between different types of user and socio-demographic backgrounds in terms of elements and attributes that contribute to Jalan Tunku Abdul Rahman (JTAR), Kuala Lumpur being a friendly urban commercial street. This research involves three major aspects: the needs and perceptions of users; the reasons and factors that influence user-friendly street; and the socio-demographic backgrounds (key types of user, user activities and the cultural, gender, ethnic, socio-economic and life cycle stages of the users).

The causal factors influencing street friendliness, such as gender, ethnic groups, economic status and life cycle stages, will be used as dependent variables. Whereas physical attributes and characteristics, uses and activities and image will be used as independent variables that significantly contribute to user-friendly streets. The focus of the study is on the physical, functional and social aspects of the street in order to substitute for user-friendly street. The key criteria for street attributes and characteristics are: comfort and convenience, safety and security, and accessibility. These factors were based on the literature review, in which the most mentioned criteria that relate to the use of the urban space were chosen (refer to chapter 3 (three) and appendix 1). In the context of Malaysia, the socio cultural group factor of the user has very little variation in the perception of the Malaysian urban environment (Shamsuddin, 1997; Mijan, 2000). However, this factor is considered as significant in the data analysis of this research, as according to Loukaotou-Sideris (1995), in environmental behaviour studies the use and perception of space varies for different user groups. Hence, in this research, is look at other users' perception of the street environment towards user-friendly urban-commercial street.

Based on previous studies in urban spaces in Malaysia, types of users were identified based on different criteria. The definition of users is people who use the street whether they are residents or non-residents (Wan Abdullah, 2007). Mijan (2000) identified seven types of user who use public spaces in the city centre of Kuala Lumpur based on their roles: shoppers, visitors, street vendors, shop owner, shopkeepers, residents and office workers. Mijan (2000) and Ujang (2008) in their studies clustered the users of the streets into two distinct groups which is static users for those who have constant engagement with the place and dynamic users for those who are not dependent on the place for income, occupation, education or residence. According to Mijan (2000), the static users are such as shopowners, shopkeepers, vendors , office workers, residents and students, meanwhile the dynamic users are such as shoppers and visitors who being on the place as the moving entity.

The users of the street in this research is divided into daily users (those who are constantly engaged with the place due to dependency for income), occasional users (those who are not dependent on the place for income) and non- users (those who are not using the street study) who are Kuala Lumpur city centre residents. The reason for using them as respondents is because they are the people that use the street in Kuala Lumpur city centre. Therefore, if the streets are friendly to them it will be friendly to all other users. In doing this research, there are practical considerations and limitations, such as time and resources. The limitations of this research will be explained in another section in this chapter.

4.3 Research Process

In this study, the research process begins by establishing the background of the research. The background of the research is identified by the issues and the aim (to test a theory deductively or support it and to understand the meaning given to a phenomenon inductively) and objectives of the research, which are based on the issues and literature review that are relevant to the research areas The literature review is used to justify problems and plays a major role, especially for quantitative research (Creswell, 2009) in which it used to identify questions and assumptions.

The scope and limitations are determined after the background information gathered on the context is selected. Related variables and criteria are identified based on relevant theories, local issues and concerns. Based on the variables and criteria, the theoretical and methodological framework for the research is structured. The appropriate method, strategies, techniques and instruments for data collection are developed before commencing the fieldwork. Then, data from all sources are gathered and analysed using the most appropriate method and techniques of analysis. Lastly, interpretations and recommendations are made concerning the research findings. The findings are related to the reviewed theories in the literature and also with the issues of the research.

Research Design of the study

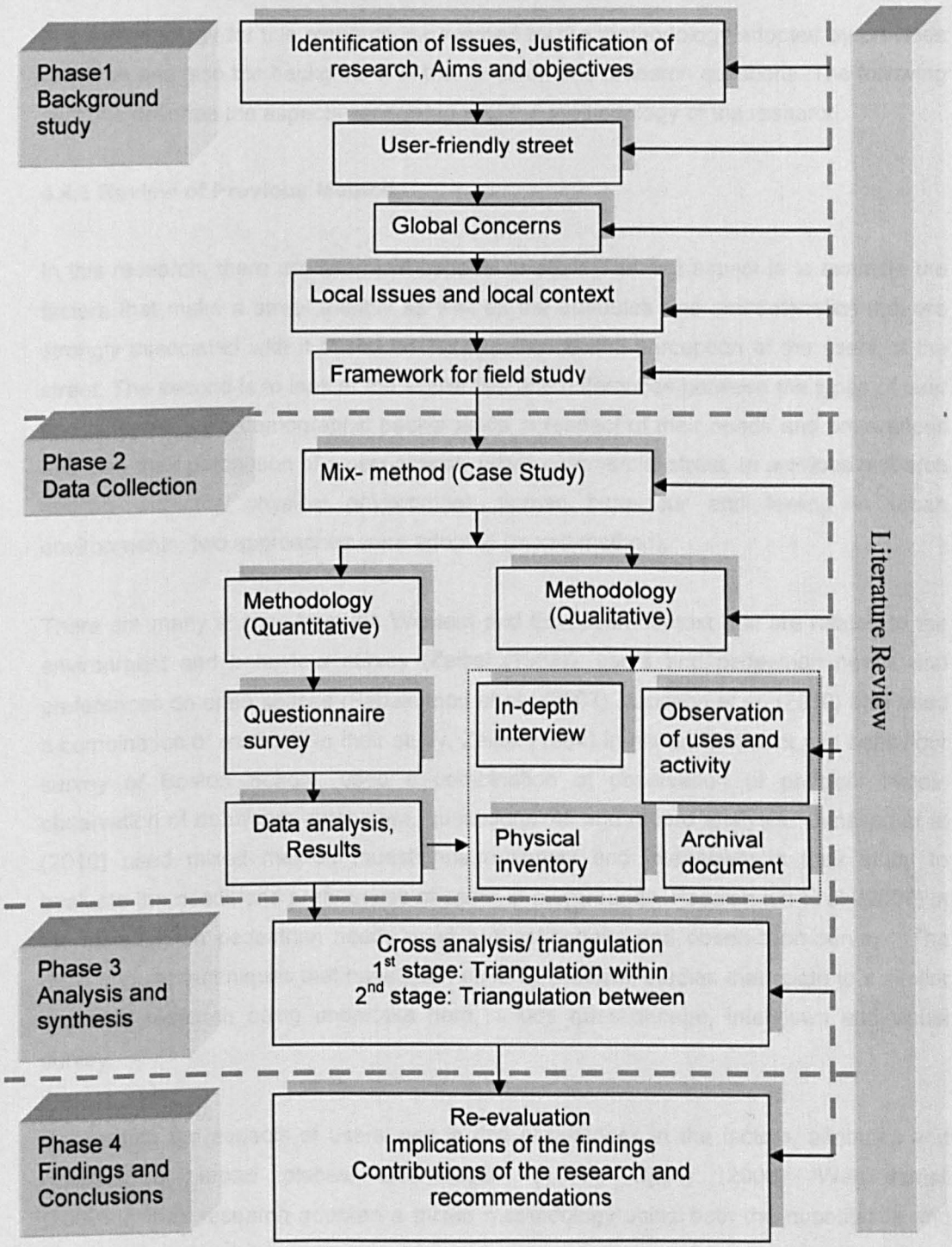


Figure 4.1: Research Design of the study

4.4 Choice of Methodology

The methodology for this research is governed by the methodology adopted by previous research and also the background of the research and research questions. The following sections describe the aspects associated with the methodology of the research.

4.4.1 Review of Previous Method

In this research, there are two main aspects to seek. The first aspect is to examine the factors that make a street friendly as well as the attributes and characteristics that are strongly associated with it based on the experience and perception of the users of the street. The second is to look at the similarities and differences between the types of user and different socio-demographic backgrounds in respect of their needs and preferences and also their perception of a user-friendly urban commercial street. In previous research dealing with the physical environment, human behaviour and feeling in urban environments, two approaches were adopted (mixed method).

There are many studies from the Western and European context that are related to the environment and behaviour survey (Zeisel (1984)), users and pedestrian needs and preferences on open spaces (Papaionnou et al., (2007). Jansson et al. (2010) also used a combination of methods in their study. Zeisel (1984) in his environment and behaviour survey of Boston School, used a combination of observation of physical traces, observation of behaviour, interviews, questionnaires and record analysis. Jansson et al (2010) used mixed method (questionnaire survey and interviews) in their study to evaluate the needs and preferences of users of playgrounds. Papaionnou et al. (2007) in his research on pedestrian needs used a questionnaire and observation survey. The most popular techniques that have been used by previous studies that relate to a similar scope of research being undertake here include questionnaire, interviews and visual survey.

Concerning the aspects of users' needs and preferences in the factors, attributes and qualities or urban places, Shamsuddin (1997); Ujang (2008); Wan Ismail (2009) in their research adopted a mixed methodology using both the quantitative and qualitative method in data collection and analysis to investigate the elements and qualities associated with built environment qualities in Malaysia. Shamsuddin (1997), in her quantitative approach, conducted a questionnaire survey using a sample of the town centre residents to survey residents' perceptions concerning the town centres'

environment and the profile of its residents. A cross tabulation table was used to identify the elements perceived by the different ethnic groups, gender, age and status (Shamsuddin, 1997: Wan Ismail, 2009). The quantitative approach used four techniques: focus interview, sketch map task, photo recognition interview and visual survey, which included field observation and recording.

In addition to questionnaires (Shamsuddin, 1997; Ujang, 2008), another popular technique that has been applied in previous research to look at the pattern of use, actual use and activities on site was site observation (Ujang, 2008; Abdul Latip, 2011). Observation techniques have been used as method to look at the variations of use in site study (Sideris, 1995; Ujang, 2008; Mehta, 2007, 2009). Laokaitou-Sideris (1995) examined four case studies of neighbourhood parks in Los Angeles in order to explore similarities and differences of their uses and assigned meanings. She used structured field observations and surveys of users in order to examine socio-cultural patterns of park use, the relevance of past models of park design, and the level of fit between current park form and contemporary user' needs. Ujang (2008) in her study of place attachment towards shopping district in Kuala Lumpur city centre where one of her case studies is JTAR adopted a mixed methodological approach. She, in her study adopted surveys and face to face interviews to elicit user's account of the places; and systematic field observations to gather actual scenes of the places (Ujang, 2008).

This research also looks at users' activities on the street as part of the criteria to assess the needs and preferences on the street. Based on previous research, in order to study human activities and behaviour in space, the most common technique applied was observation and interviews. Appleyard (1972), Whyte (1980, 1988), Cybriwsky (1999) and Mehta (2007) used direct observation in studying human behaviour in urban space. They used this method in order to identify why some city spaces work for people and some do not and what draws people and what keeps them away. Whyte (1980, 1988) studied how people used the urban space by using a mounted time-lapse camera to overlook the space and record the daily pattern. He also interviewed people to get the information on peoples' uses and activities such as where they came from, where they work, how frequently they used the place and peoples' perception of it. Min et al. (2006) conducted multiple behavioural observations for identifying this domain and for recording activities in different locations (behaviour mapping). Mehta (2007, 2009) employed a multi-method survey strategy involving a variety of techniques to collect data on the behaviour of the users on the street. Mehta (2007, 2009) used observation in her study to understand the relationship between the temporal and spatial form of the physical setting

and people's behaviour (to examine how people used the streets). She used behavioural mapping to link the design features of the setting with behaviour in both time and space. She applied walk by observation, as well as structured and unstructured direct observations. In this research, the techniques used by Mehta were employed to look at the users' activities in the urban commercial street.

Interviews are another study technique to seek users' feelings and perceptions towards the environment. Whyte (1980, 1988); Appleyard (1972); and Mehta (2007; 2009) conducted a survey and interviews in order to get in-depth information to understand the users' feelings, perceptions and attitudes towards street environments that were being observed. Arefi et al. (2003) also used interviews to analyse resident's perception of public space in Visakhapatnam, India. The sample was drawn from all socio-economic levels of residents. The interview schedules contained open-ended questions eliciting resident's perceptions on public space and their demographics (Arefi et al., 2003).

In other human-environment research, Min et al. (2006) used open-ended field interviews and behavioural observation in their research investigating children's psychologically important places and their neighbourhood activities. They used unstructured interviews with open-ended questions, with children playing outdoors in order to identify places important to them as well as meanings, associated with such places. Moore et al. (2007) used a multi-method research strategy to assess the park design through a participatory, inclusive approach that regards users' knowledge and behaviour as a valid and appropriate body of data. Three types of data were collected; park spontaneous activity data were collected using behaviour mapping, behaviour tracking and setting observations using informal observations; videotaped park visits; and on site interviews were conducted with the park users.

In achieving objectives one and two in this research, the study of quality of the built environment is needed. Appleyard et al. (1972) used field interviews and observations on their research on streets to determine how traffic conditions affected the liveability and the quality of the street environment. They used in-depth interviews and systematic observations to obtain environmental concerns of pedestrians and traffic activity on streets. Smith et al. (1997), in their research project, investigated the physical environment that contribute to the quality of a community and that meets the needs and desires of its visitors and inhabitants. The methods involved descriptive research, matrix development and case study applications. Nikolopoulou et al. (2006) used observations and interviews in their field survey method, to evaluate the comfort condition people

experience and their perception of the environment. Individuals' characteristics and behavioural patterns were also taken into account. Eliasson et al. (2007) used four urban spaces as case studies in investigating how weather and microclimate affect people in urban outdoor environments. Observations and structured interviews were conducted simultaneously during four case studies.

Much of the literature is based on a Western and European context. There have been few studies conducted regarding the relationship between the environment and human behaviour study in the Asian context. Perhaps the concept and variables pertaining to it that have been discovered are not similar to Malaysia. Hence, previous research dealing with man-environment has been undertaken in countries of different social, cultural and economic backgrounds than Malaysia. Previous methods have suggested that the use of combined methods provides the study with a more complete understanding of the phenomena and other related aspects of concern. Most of the previous research in similar issues used observation and the interview technique as the main methods rather than a questionnaire survey. In this research, the study attempt to integrate the methods employed by previous research by using a questionnaire as the main method and site observations and interviews as supportive techniques.

4.4.2 Background of Research and Research Questions

Another criterion in determining the methodology to be adopted is the background of the research and research questions. According to Strauss and Corbin in Shamsuddin (1997), the way research questions are formulated determines the research method that is used. Most of the previous research dealing with man-environment studies has been undertaken in other countries with different social and cultural backgrounds. Hence, some of the concepts and findings of the variables and attributes that have been discovered in previous research are not significant for urban environments in Malaysia.

It is the aim of this research to determine the criteria of user-friendly streets, their needs and preferences on streets, how people use the streets and why they use the streets? This research also looks at the relationship between the quality of urban space (physical quality and social quality) that relates to the human desire for using the streets and the similarities and differences of a friendly street to people from different socio-demographic backgrounds. More specifically, this research revolves around several research questions and issues. *'Good research questions are those that enable you to achieve your aim and which are capable of being answered in the research setting'* (Gillham, 2000, p.17).

The first objective in this research is to identify the reasons that make a street friendly to the users. Look at the relationship between the street users' activities and the built environment. This objective is to look at the degree to which the environmental quality of the urban commercial street satisfies the needs and preferences of the users, in other words, to examine whether it is fit or unfit for the users. This objective is to look at the quality of the street and human activities in street. In summary, this objective is more to seek the actual needs of the users and their activities in JTAR.

The second objective is to examine the attributes and characteristics that make a street friendly to the users. This objective is to identify if the quality of the street today (physical quality, functional quality and social quality) represents an environment that can facilitate the user's needs. This objective is more to examine the users' perceptions of a friendly street and what makes them use or not use the street.

The last objective is to determine the similarities and differences in the use of the space-users activity, preferences and needs of the urban users and the quality of friendly streets between users with different types of user and from various socio-demographic background (such as gender, age and ethnic). Sideris (1995) stated that in environmental-behaviour research, the use and perception of space varies for different user groups. In this objective it is to identify the physical characteristics and environmental quality of the space relevant to the different social values and users needs.

4.5 Method Adopted in the Research

The enquiry employed a multiple method survey strategy involving a variety of techniques to collect data on the users' preferences, needs activities, and uses of streets. According to Ovstedal et al. (2004), they found it fruitful to combine methods, to look at questions from different angles, as well as explore the issue in the stages of a survey. As Hammersley (1981) stressed in social research, reliance upon a single piece of data is dangerous because undetected errors in the data production process may render the analysis incorrect. Qualitative methods focus primarily on the kind of evidence (what people tell you, what they do), which will enable you to understand the meaning of what is going on (Gillham, 2000). The structured visual surveys and other quantitative techniques provided data that could be analysed using quantitative methods (Mehta, 2007). Examples of qualitative methods are action research, case study research and ethnography. Qualitative data sources include observation and participant observation

(fieldwork), interviews and questionnaires, documents and texts, and the researcher's impressions and reactions.

In this research, there are two complementary research methods used, field studies and a survey. Based on the literature, the survey attempts to be representative of larger populations and field studies, observing and thoroughly investigating the behaviour, needs and attitudes of people playing interdependent roles. The questionnaire survey is the main method in this research. Meanwhile, observations, interviews, other documents, record analysis and so on are different sub methods. This supported by Shamsuddin (1997) who stressed that the field study provides a more detailed and true picture of the interrelations of a group as compared to a survey.

Many research projects combine the use of different methods or employ what is known as the triangulation approach, in which the data from different sources are combined to increase validity. There is a tendency in urban design research to adopt a combined strategy due to its multi-dimensional aspects of concern (Lynch, 1960; Shamsuddin, 1996; Shamsuddin et al., 2004; Mijan, 2000, Ujang, 2008; Mehta, 2007). This research seeks to examine the concept of user-friendly street and the factors influencing it. The research also focuses on identifying attributes and characteristics of the street that influence a user-friendly street. In order to satisfy the aim of the study, this research adopted a variety of techniques (quantitative and qualitative). This involved a questionnaire survey of the users in the study areas in order to look at general pattern of the users' perception of a friendly-street. Interviews were conducted with a group of users on Jalan Tunku Abdul Rahman JTAR) to probe and get richer details and also cover the gaps that arise during questionnaire surveys. Following this, field observation was conducted to look at the physical characters and the qualities of the street that relate to user-friendly street, as well as personal observation of their activities on streets and content analysis to investigate the phenomena.

This research relies on multiple sources of evidence and the data will be converged through the triangulation method. The purpose of triangulation is to ensure that the findings drawn are not only based on any piece of evidence or methodological procedure but from the convergence of many resources where the multiple sources of evidence will provide multiple measure of the same phenomenon (Yin, 2009). This will reduce the potential of a low response rate and also any bias of the samples (Cresswell, 1994). Hence, this mixed method study will address users' perception of JTAR as a friendly street. In this research a triangulation mixed methods design will be used, where both

qualitative and quantitative methods are used and complimentary data will be collected on the same topic. In this research, survey data will be used to identify the attributes and characteristics that make the street friendly to their users. At the same, in this study, the factors will be explored using interviews, behaviour and physical observations on site with the street users in Jalan Tunku Abdul Rahman. The main data collection techniques include a survey questionnaire, in-depth interviews and physical and activities observation. However, direct observation, character appraisal and content analysis of the study were used as complimentary methods to obtain a more complete picture of the extent to which the physical characteristics of places support different types of activities. A detailed explanation on each of the methodologies applied is described in later sections under research techniques and data collection procedure.

Different methods have different strength and weaknesses (Gillham, 2000). Therefore, by using a variety of measurement techniques, the overlap and differences in the results can be compared and this will increase the level of validity. In order to minimize the problems of differences relating to validity and reliability of the data measurement and assessment, both qualitative and quantitative techniques will be employed in the research. As Gillham (2000) notes, there is a common discrepancy between what people say about themselves and what they actually do.

4.5.1 The Case Study and selection criteria

Case study is a method in which the researcher explores a single entity or phenomenon that is bounded by time and activity and collects detailed information by using a variety of data collection procedures during a sustained period of time (Wan Ismail, 2009; Abdul Latip, 2011). Case study is one of the approaches in qualitative methods (Creswell, 2007). In this research, a single case study was applied. A single case study can represent the critical test of a significant theory (Yin, 2009). The case study chosen- Jalan Tunku Abdul Rahman (JTAR) is one of the main urban commercial streets in the city centre of Kuala Lumpur. This street was selected based on the physical, functional and socio-cultural characteristics. According to Trancik (1986), these three factors of urban development play an important role in the generation of urban places.

Many reasons are considered before the area of case study is chosen. In this research, the street (JTAR) is selected because of the following reasons;

a) Identified as one of the main traditional streets in the city centre due to its inherent socio-cultural stronghold and historical significance as being among the

earliest high streets in the city centre of Kuala Lumpur (Shamsuddin et al., 2008).

b) Receives highest concentration of shoppers, visitors and pedestrians (DBKL, 2004).
c) JTAR is located in the area, which has been dedicated for urban revitalization initiatives (DBKL,2004) in (Ujang,2008)
d) The strength of its character is reflected in the architecture of the two storey traditional 'shophouses' with five foot corridors alongside formal and informal street vendors.
e) Located within diverse economic activity (predominantly commercial/ shopping area/mixed use development).
f) Identifiable as the main street and well known as popular shopping area.
g) Researcher's familiarity with the street is also very important to ensure smoothness and success of the research.

The rationale for selection for the case study area was due to four aspects; the first aspect is that the street is located in the city centre of Kuala Lumpur so it is relevant to choose as a case study to analyse the degree of friendliness of the street as the shopping street to the users that influence the user's perception; the second aspect is that the attributes and characteristics of the shopping street is relevant to examine if these attributes and characteristics do influence and contribute to friendly street or not; the different types of users will help to identify the variation of their needs and preferences towards a friendly street, and, lastly, the demographic characteristics will help to identify the similarities and differences of the needs, preferences and perception of a friendly street between different socio economic backgrounds.

The details about the case study in this research will be explained in the next chapter (Chapter 5: Case Study).

4.6 Survey Design

In Creswell (1994), the intention of survey research is to generalise from a sample to a population so that inferences can be made about some characteristics, attitude or behaviour of this population. In this research, the survey method is used for two reasons. The first reason is because the research concerns users' needs, preferences and perceptions of the shopping street that are friendly to them. Since the population involved is varied, the key users of the streets need to be identified and clustered as a sample to

represent the whole population. In this research, the stratified random sampling procedure will reflect the dominant characteristics of users of the street. The second reason is that, some of the streets are more visited and more attractive compared to the others. Therefore, the identification of the factors attributes and characteristics related to the street valued by the users help to identify what criteria need to be identified and improved to make the street friendly for them. Table 4.1 shows the elements that are associated with the attributes selected.

Attributes	**Components**	**Elements**
Comfort/ convenience	Physical Functional Meaning/ Image	Greenery/trees, View, Landscape features Microclimates, Road crossing, Pavement conditions, Public amenities, Kerbs, Ramp, Step, Street furniture, Maintenance
Safety and security		Presence of people, Illegal activities and anti social behaviour, Lighting, Safeguard/ police Vandalism/ Graffiti, Presence of activities
Accessibility/ proximity		Location, Pedestrian routes, Layout , Access Signage, Public transport
Liveability/ sociability		Activities, Mixture of people, Hospitality Social network, Number of women, children and elderly, Evening use

Table 4.1: Attributes and elements of street relevant to the research
Source: Author (2009)

4.7 Research Techniques and data collection procedures

This section discusses the techniques of the enquiry procedures involved (Table 4.2). The data collection procedures involved three phases; the first phase was establishing the theoretical framework; the second phase was preliminary investigation; and the final phase was the final investigation that contributed the real data for the research (Figure 4.2).

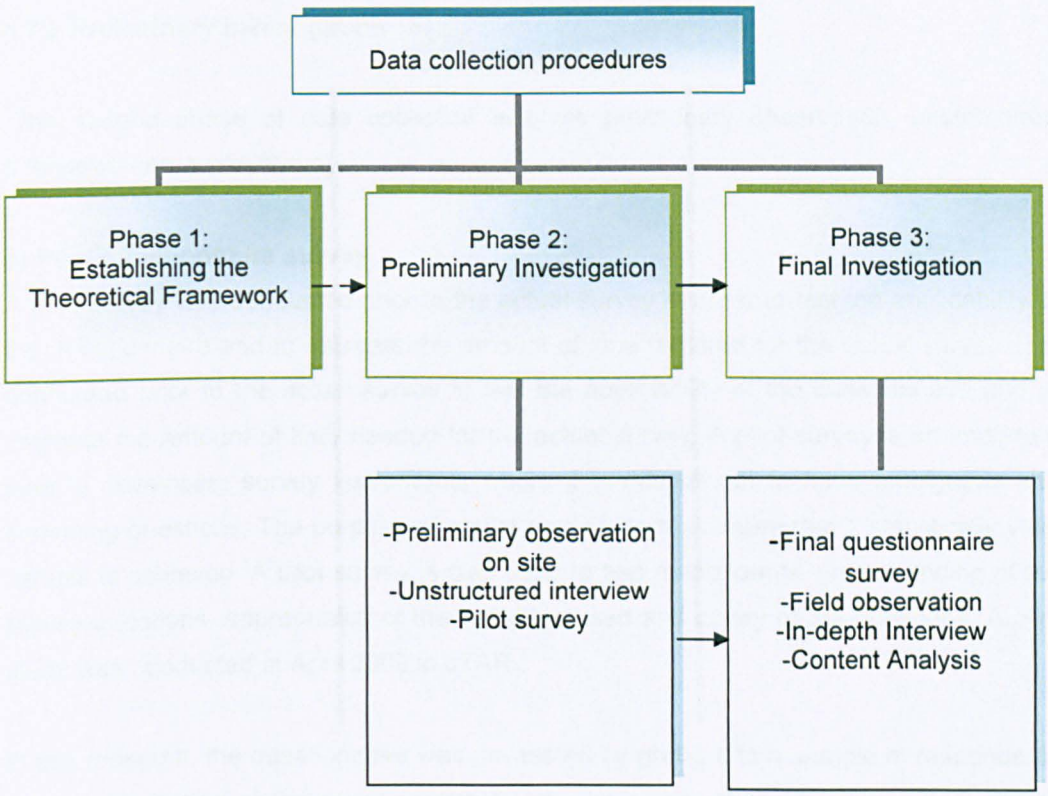


Figure 4.2: Data collection procedures

Source: Author (2009)

4.7.1 Establishing theoretical framework

This phase involved the critical review of the literature in order to develop a research focus to define the theoretical boundary of the research. This relates to establishing an understanding of the theories and concepts of streets, user-friendly streets, and street characteristics by scholars from multi-disciplinary backgrounds including urban design, environmental behaviour, health, transportation, human geography and social physiology. Principles and guidelines from established urban design practices and research groups worldwide are reviewed to gain knowledge of what qualities and character contributes to a good street and a successful street in an urban context. The resources also include books, previous theses related to the study area, research articles from journals, guidelines from urban design practice, review of government publications, local newspapers, maps and photographs.

4.7.2 Preliminary investigation

The second phase of data collection involves preliminary observation, unstructured interviews and a pilot survey.

a) Pilot questionnaire survey

A pilot survey was conducted prior to the actual survey in order to test the applicability of the questionnaire and to estimate the amount of time required for the actual survey. It is conducted prior to the actual survey to test the applicability of the questionnaire and to estimate the amount of time needed for the actual survey. A pilot survey is an important step in developing survey instruments where it is difficult not to have ambiguous and confusing questions. The purpose of a pilot study is to make sure that a statistically valid sample is achieved. A pilot survey is also used to test respondents' understanding of the survey questions, appropriates of the variables used and clarity of the questions. A pilot study was conducted in April 2009 in JTAR.

In this research, the questionnaire was pre-tested by giving it to a sample of respondents chosen for testing of the questionnaire to test the clarity of the questions and also to estimate the time required for the actual survey. The techniques of questioning are also used so that the results of the exercise can be used to modify the interview technique. The pilot questionnaire survey included a random sample of 33 representatives of both daily users and occasional users of the street using time interval techniques. In this pilot survey a 4-point Likert scale measurement was applied. This was because according to Ujang (2008), respondents have a tendency to answer "agree" (Likert value: 3), which may neutralise the feedback. This can avoid biasness towards more neutral answers.

A few weaknesses of the questionnaire have been identified during the pilot survey. The time of 15-20 minutes taken to answer the survey affected the focus of the respondents especially shopsowners and shopkeepers. In the pilot study it was reveal most of the respondents did not answer the open ended questions. The respondents were not willing to write; therefore, some of the surveys had to be fully administered by the researcher.

It was found that there are three important aspects that need to be considered in conducting a survey; time location and convenience. Therefore, a new strategy was considered in the selection of respondents for the questionnaire survey.

b) Preliminary observation and unstructured interviews

The preliminary investigation on site study involved personal observation of JTAR to capture the landscape and atmosphere of the site, to identify the key features, the physical, uses and activities of the street. Unstructured interviews were also conducted with respondents in JTAR. The respondents were randomly selected based on the respondents' willingness to participate. The interviews were to understand the spontaneous feeling and perception about the street. The conversation was noted so that it could be used as guide to determine how people think and react to issues, to identify the appropriate variables for measurement of the chosen context and, most importantly, to create a better frame format for the actual questionnaire surveys and interviews.

Based on the data gathered from establishing theoretical framework and preliminary investigations, the procedure for the final process was structured to collect the relevant data.

4.7.3 Final investigation

Since this research deals with the multi-dimensional nature of urban environment, its full features cannot be revealed with a single technique, hence, multiple techniques must be employed. There were three main techniques used in this research. These techniques include questionnaire survey, interview, and field observations. Gillham (2000) argued that a case study research is the main method and within it different sub-methods are used including interviews and observations. In order to understand human behaviour, needs and feelings, we have to look at people in real life and study them in their context and in the way they operate. Gillham (2000) noted that how people behave, feel, think can only be understood by getting to understand their world and what they are trying to do in it.

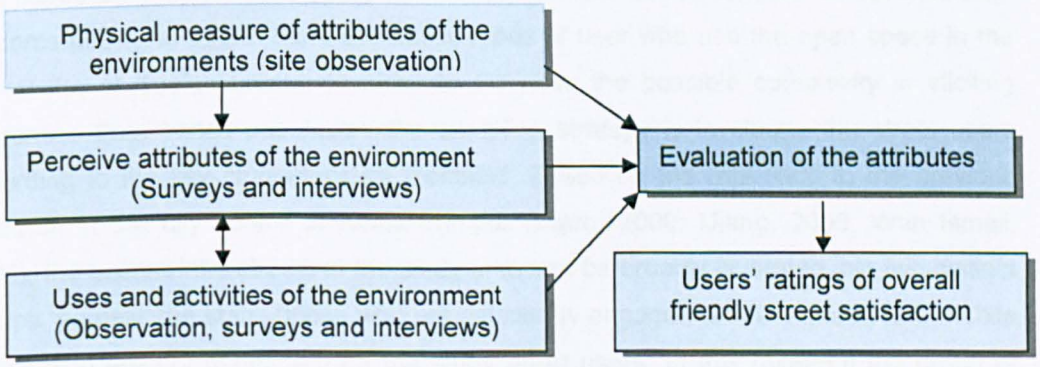


Figure 4.3: Research techniques

Source: Author (2008)

a) Questionnaire survey

In social research, questionnaires have been widely used to assess user's needs, evaluation and environmental and behavioural research ((Bechtel, et al., 1995; Kuter, 2001 and Robson, 2002) in Tukiman 2008). A sample survey was conducted of the Jalan Tuanku Abdul Rahman in the Kuala Lumpur city centre. Before the real survey was conducted, three things about sampling need to be considered; the definition of the population; how sampling represents the population; and sampling size.

The following sections explain the aspects considered in the questionnaire survey method:

i) Defining the target group of respondents

The main issue to be researched is to identify the factors and attributes of the street that are friendly to the users. Therefore, the sampling in this research is the users of the street in Kuala Lumpur city centre. According to Wan Abdullah (2007), the town users are people who frequent a town and are familiar with the environment regardless of whether they are residents or non-residents. The 'users' in this case are basically the people who are using the streets. However, based on the pilot study, it is evident that it was hard to get respondents on the street. Therefore, in this research, the respondents were selected from the residential areas within the boundaries of the Kuala Lumpur city centre. This is to ensure that the respondents are familiar with the street studied.

Based on the preliminary observations of the Jalan Tunku Abdul Rahman (JTAR), it is shown that the users of the street are varied in their characteristics. Therefore, it is hard to determine the 'users' of the street based on particular activities since the streets facilitate various activities (Shamsuddin et al., 2004). Mijan (2000) in his research found that based on their role- shopper, visitors, pedestrian, street vendors, street musician, students and fixed users- there are seven types of user who use the open space in the city centre of Kuala Lumpur. In order to minimise the possible complexity in eliciting responses from varied population, the sampling strategy is to cluster the street users according to the key characteristics identified. Based on the reference to the previous research in the city centre of Kuala Lumpur (Mijan, 2000; Ujang, 2008; Wan Ismail, 2009), the users of the streets in the study area can be broadly clustered into two distinct groups, namely, the static (those who are constantly engaged with the street) and mobile (those who are not dependent on the study area) users. In this research the group of respondents is divided into two main groups- the daily users and the occasional users.

ii) Determining representative samples

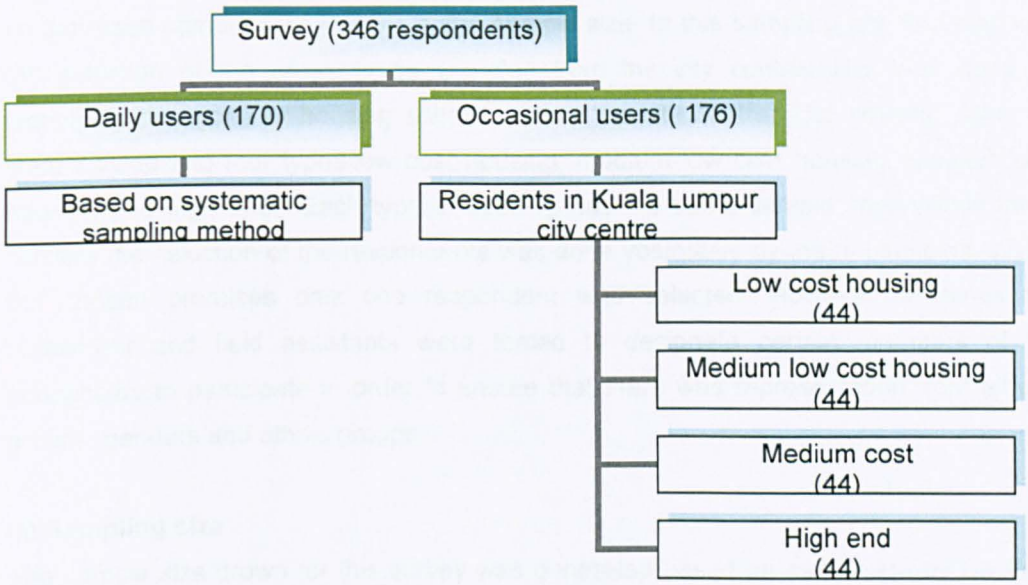


Figure 4.4: Representative samples of respondents

Source: Author (2008)

There are two types of sample -probability and non-probability samples (Cresswell, 1994; Brymann, 2004). According to Bryman (2004), a 'probability sample' gives an equal chance of each unit of population to be selected as a sample and keeping sampling error to a minimum while the non- probability sample does not give an equal chance to be selected, which implies that some units in the population are more likely to be selected than others. Therefore, in this research, probability samples are used because they are more likely to produce representative samples.

In this case quota sampling is used in which the respondents were broadly divided into daily users and occasional users (Figure 4.4). The daily users (shop owners, shopkeepers, vendors, office workers) were selected based on the systematic sampling method using the interval of unit spaces on the ground level of the street (shopping space, restaurants, stalls, stores and shop premises). In this sampling the total of the units within the street of JTAR is divided by the total number of sample size required. Based on observation on site the number of unit spaces is 346, which is divided by 170 (the total number of sample size required). Therefore, the selection of respondents is based on an interval of 2 units.

In collecting data for occasional users, the population to be sampled resides within the boundary of city centre as defined by DBKL. The quota sampling is used as a technique so that each sample area has the same sample size. In this sampling, the first step was the selection of the areas to be sampled from the city centre. This was done by identifying the types of housing scheme within the city centre. The housing schemes were divided into four types-low cost housing, medium low cost housing, medium cost housing and high end. Each type of housing has the same sample size. Within these clusters the selection of the respondents was done voluntarily by the households. Within the chosen premises only one respondent was selected. However, at times the researcher and field assistants were forced to designate certain members of the households to participate in order to ensure that there was representation from all age groups, genders and ethnic groups.

iii) Sampling size

The sample size drawn for this survey was generated based on calculation by De Vaus (1991) (refer to table 4.2); 330 respondents should participate in the survey representative of the streets based on Ujang (2008) and Shamsuddin (1997), and based on Appleyard (1981) in his study in which he chose 300 respondents. This is based on a 5.5% sampling error at 95% confidence level (Cresswell, 2007, p.113). The sample needs to be large enough for statistical procedures to be used that will make it possible for the researcher to draw inferences with some confidence that the sample reflects the characteristics of the entire population.

Sampling error (5%)	Sample size	Sampling error (5%)	Sample size
1.0	10000	5.5	330
1.5	4500	6.0	277
2.0	2500	6.5	237
2.5	1600	7.0	204
3.0	1100	7.5	178
3.5	816	8.0	156
4.0	625	8.5	138
4.5	494	9.0	123
5.0	400	9.5	110
		10.0	100

Table 4.2 Sample size required for various sampling at 95% confidence level

Source: De Vaus, 1991, p.71

In this research, the total number of respondents was (346). It was divided by almost two equal halves, 170 for daily group of users and 176 for occasional group of users. Based on previous research, it is suggested that the researcher uses a similar formula in determining the sample size. Appleyard (1986) involved 300 randomly selected residents from four housing schemes in his study in Venezuela. In a study on the criteria of success for three selected traditional shopping streets in Kuala Lumpur conducted by Shamsuddin et al. (2004), 330 randomly selected respondents were used. Ujang (2008), who studied place attachment to shopping districts in Kuala Lumpur city centre, involved 330 street users. The survey was conducted on weekdays and weekends.

iv) The questionnaire design

In this research, a questionnaire was used and distributed to the sample of the street's users. According to Bell (1990) in Shamsuddin (1997), the best way to measure mood , thoughts, attitudes and behaviour is by asking the subjects how they felt, what they are thinking and what they do or have done. Their perception and opinions from the survey will provide quantitative data for the research. Hence, this survey technique is useful to determine what is going on in the peoples' minds or how they felt about the environment. However, it must be supported by other techniques (Shamsuddin, 1997; Ujang, 2008). According to Ovstel et al (2004), interview forms and questionnaires that are ready to fill are commonly used to investigate different road users' experiences, behaviour and preferences. Some advantages are obvious; with restricted resources it is possible to get a considerable amount of data and it is relatively manageable for the respondent to answer, especially when there are ready to tick answers. It may also be possible for the researcher to prepare and test the questionnaire or the interview form.

In this research, two sets of questionnaire have been designed. The first questionnaire was designed for the daily user group and the other for the occasional groups who were the residents of Kuala Lumpur city centre. Both sets of questionnaire were designed with a combination of multiple choice and semi-structured questions. Questionnaire surveys were collected in housing areas in Kuala Lumpur city centre (High, Medium, medium low and low income housing area). Rapoport (1990) suggested three general questions for environmental behaviour studies; these questions help to evaluate the validity of social science to design and plan. The questions concern the characteristics of people , how and to what extent does the physical environment affect people's behaviour, mood, well being, and so on; that is, how important is the built environment, for whom, under what sets of conditions, and why? And for corollary questions that give the mutual interaction

between people and environments, there must be mechanisms linking them; what are these mechanisms?

The questionnaire survey has three parts (Figure 4.5). The first parts cover the information concerning users' activities in the streets; why they use the place (the purpose for which they use the streets); (types of activity and pattern of use); social groupings; and frequency of visits. The second part covers the information pertaining to the users' perception of the streets; how they perceive the space; their needs and preferences concerning the attributes and characteristics of the street towards friendly streets; and their comments about the qualities of the street they used. The last part covers the information concerning socio- backgrounds, concerning their sex, age, race, occupation, educational level, religion and residence and degree of experience in the town centre.

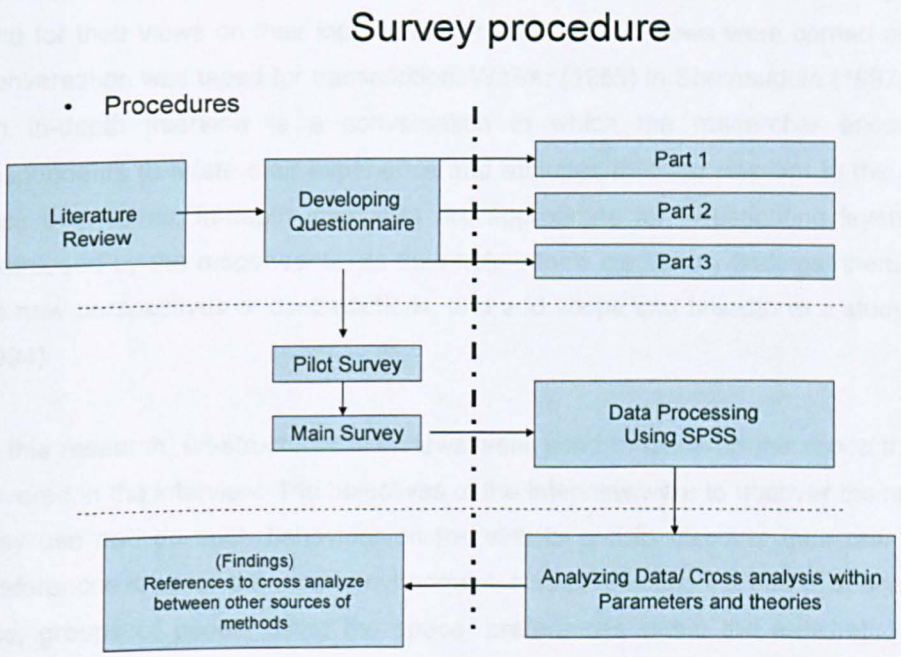


Figure 4.5: Survey procedure
Source: Author (2009)

In the first part (section A), ten questions on users' activities in JTAR were posed. The first question asked the respondents whether or not they have been to JTAR. If the answer for this question was no, they have to skip Section A and continue to Section B. All questions under this part were given multiple-choice answers. For the second part (section B), twelve questions on users perceptions on qualities and attributes that make

them use the street that contribute to it being a user-friendly street. The questions consist of closed- and open-ended items (refer to Appendix 2). The last part (section C) comprises eight questions on demographic factors. All questions were given multiple-choice answers.

b) In-depth interviews

In this research, in depth interviews were utilised to complement the quantitative data. The use of interviews as a technique in man-environment behaviour research is common. The interview technique is used when small numbers of people are involved. Gillham (2000) argued that interviews are an indispensable method in case study research. Most of the studies relating to human behaviour and needs in the built environment in the past tend to use interviews as their main technique (for example, Elliason et al,2007., Appleyard et al.,1972, Sideris, 1996, Moore et al., 2007 and Arefi et al., 2003). Matthew et al. (1999) used in depth-interviews in which people were asked how they use places and for their views on their local environment. The interviews were carried out and their conversation was taped for transcription. Walker (1985) in Shamsuddin (1997) noted that an in-depth interview is a conversation in which the researcher encourages the respondents to relate their experience and attitudes that are relevant to the research in their own terms. In-depth interviews are appropriate for investigating layers of issues expressed by the respondents, as they help inform the survey findings, thereby opening up new perspectives or contradictions, and add scope and breadth to a study (Creswell, 1994).

In this research, un-structured interviews were used to focus on the scope that must be covered in the interview. The objectives of the interview were to uncover the reasons why they use and do such behaviour on the streets and to discover their real needs and preferences towards the urban environment. Issues affecting the use of space (pattern of use, groups of people using the space, preferences within the area, etc.) were also investigated. Unstructured interviews provide the opportunity to probe deeply based on users' personal experience. However, according to Burgess (1982) in Shamsuddin (1997), the researcher needs to establish a framework within which the interview can be conducted. Ovstedal et al. (2004) conducted on-street interviews to seek the factors influencing the pedestrians identified, which included questions about how they felt there with a few questions about respondents and the current trip. In-depth interviews provide a lot of information about how the users think and feel about the theme (Ovstedal, 2004).

In this research, in-depth interviews were conducted after the questionnaires had been collected. Therefore, this procedure will open up for potential issues to emerge, which may not being addressed in the survey. In these interviews the researcher has the opportunity to probe in detail and uncover new perspectives and contradictions for the study. In these interviews, the number of questions and the wording of the questions are identical for all respondents. For the interview, a small and carefully chosen sample can be used to represent a selected user group (Yin, 2002). A convenience random sample of 20 street users was interviewed. According to Shamsuddin (1997), in determining the sample size, it is stated that if qualitative studies are undertaken in conjunction with a quantitative survey, the number of the sample should be between 20 to 40 respondents. The case study is divided into two areas. People were randomly approached in each area and all the respondents were engaged with the pedestrian activity during the time they were interviewed. The reason being was to avoid the participants evaluating the environmental quality variables from memory.

In this research the type of user, age, sex, and ethnicity are the important characteristics that must be considered in selecting the respondents. The respondents that are selected for the interview consisted of people from various socio-demographic backgrounds. The selection of the respondents to participate in the interview also depended on their willingness. The vital consideration is that they must be the pedestrian users on the urban public space who engaged with the pedestrian activity during the time they were interviewed. The in situ interviews will assure that the participant's phenomenological observations are recorded and that the perceptions while moving could be considered in the final outcome. The interviews were conducted in two languages- English and Malay. The usage depended on the people and the site of study, in Kuala Lumpur, the people especially the older generation cannot understand and speak English.

c) Observation

A systematic reconnaissance of the selected city centre was conducted with the goal of recording the activity and human aspects of the places. This was done in the form of a visual survey. In this research, the visual survey was conducted as part of the multi-method approach to record the physical characteristics and the qualities in urban pedestrian environments and to study human activities on streets.

There are two ways of observing whether the places are fit to the users or not, the first is by watching people acting in the place in order to observe how the inhabitants' actions match the characteristics of a location, and the second method is to ask the users

themselves (Lynch, 1981; Whyte, 1980,1988). As Carr et al. (1995) argued, any good analysis of a public space must begin by spending time there, watching how the place is used, and recording how its feels. Through observation we can determine how people act in a place by analysing the place and actual behaviour (Smith et al., 1997). Observation is also the main technique when the primary purpose is explanatory description. Describing what you see and explaining it. Videos can be a great help because the same observation can be repeated many times and each time you will see more (Gillham, 2000).

Observations were designed to provide information on pedestrian users and space use: how many people were using the different space areas during weekdays and weekends, which were the peak used periods, what sorts of activities were taking place on the streets, in what types of activity did different user groups participate. According to Wan Abdullah (2007), photographic documentation can improve observational effectiveness by allowing the study of an event in detail. Hence, it can also be used to inventory spaces as well as to show how people use spaces. This technique is applicable to this kind of research because it provides other options of recording (Wan Abdullah, 2007). The physical and functional components of the street, physical and functional changes of the space according to specific time frames and physical and functional changes that might occur during the course of the study to the spatial environment can be records through this photographic documentation.

i) Field Observations procedures

In the field observations, two main pieces of data are sought (Figure 4.7). First, is to identify the physical characteristics of the space, the quality of the environment (physical and social quality) of the space. The variables relevant to the pedestrian experience on urban space were first selected from the literature, previous research and studies in engineering, architecture and psychology (Appleyard (1972), Whyte (1980, 1988), Jacobs (1993), Sideris (1995), Moughtin (1996), Smith et al., (1997), Naderi et al., (2005), Nemeth (2007)). The variables of the qualities and needs are selected in the main categories and under those categories the sub-categories are selected. Based on this checklist, the observation was conducted and the qualities of each sub-area in the site were identified (Appendix 5). Field observations and documentation of the quality of the site were conducted for each sub-area of the case study. The survey of the sites was also recorded in the map of each site and photographic records were also taken. In this research, the visual survey is a record of the actual physical and social appearance of the sites. This is used to make use as a basis comparison between the quality of every site

and the relationship with the level of use of the study sites. The visual survey also recorded and photographs records were taken of all the major elements in the space, buildings use, activities, landscape features and overall environment of the sites. The information is a useful source of reference in the analysis of the research. The basic audit tool was a physical features checklist, which was adapted from the literature review.

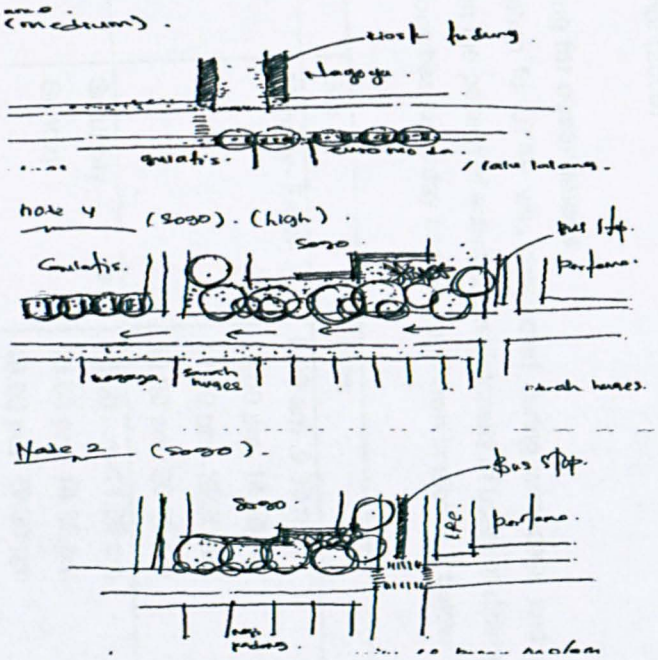
Second, the aim in this observation technique is to watch what people do in the space. In this research, structured observations were used using a behavioural mapping procedure. These observations focus on behaviour (human activities), watching their behaviour for a specific time and specified way counting and classifying what can be observed (Gillham, 2000). In this observation, how people behave on streets, what types of activity they did, with whom (alone or by groups) and where they preferred to be and how long they spend their time there was recorded. For each observation age category, sex composition, and race characteristics were also recorded. In order to make the observation of the human behaviour more systematic, each site was divided into sub-areas.

Field notes and related photographs were taken to look at users' interactions in the setting with physical settings, features and so on. Regularities over events and why it occurs in the context of a friendly street were also taken into account. Observations were carried out on weekdays and weekends. Walk by observations were used to record social activities. Each person was represented by a dot on the coding sheet. Activities such as sitting, walking, standing and others were recorded. Apparent age, gender, activities were recorded for ease of recording and making notes of the actual situation using map/fill in form.

Observations using mapping activities procedures were carried out, where the street was divided into sub-areas (Mehta, 2007). A thirty-minute observation session recorded the activities within the boundaries of each sub-area of the street (Mehta, 2007, 2009). Research assistants consisted of graduate students who were trained during visits to the site and trial observations were conducted to check the appropriateness and validity of the observation forms and inter observer-reliability. Interval sampling was used in this research. This is because the behaviours that happen in the space might be at high frequency so that continuous observation is unnecessary to achieve a representative picture. In this research, observations of human activity and behaviour are made every thirty minutes for each session and the observations were taken during weekdays and weekends.

In this research the spontaneous activities on the streets were collected using behavioural mapping in which data is recorded on a paper plan of the site (Figure 4.6), behaviour tracking, which records the use of the site by single individuals or small groups and the data is recorded on a paper plan (time they spend, entry and leaving); this covers a range of user type such as age, ethnicity and gender (Rapoport, 1990) and setting observations are where detailed activity in the setting for the duration of a natural sequence of activity occurring in that space. In setting observations the information is noted on a standard form with fields for weather conditions, qualities of setting, type/size/age/gender of groups, types of activity, durations, components of setting used and other observations (Moore et al., 2007).

Structured Observations



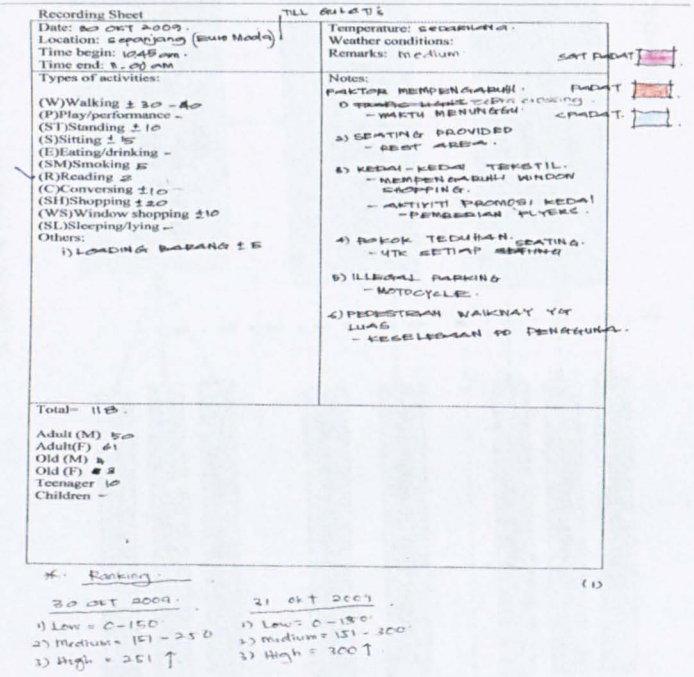


Figure 4.6: Sample of activities observation in one of the nodes in JTAR

Source: Author (2009)

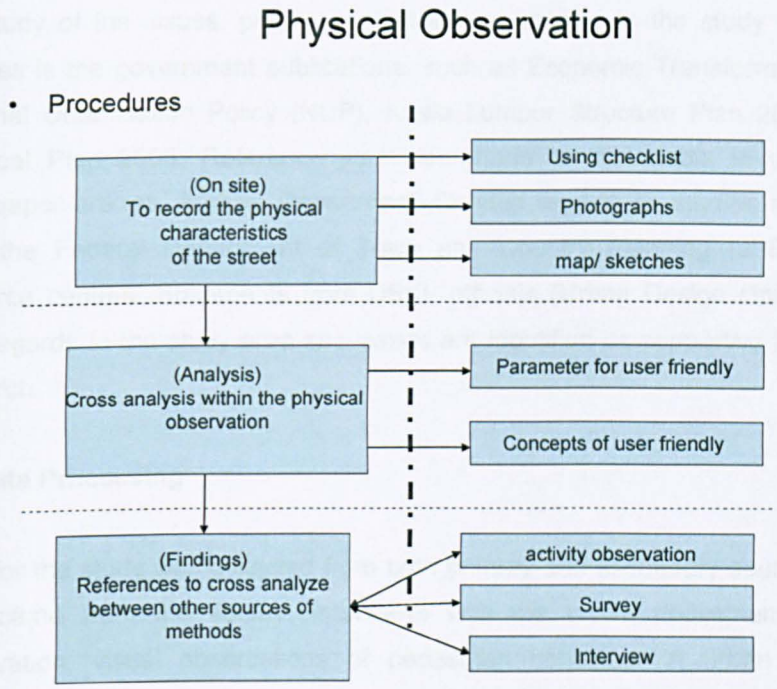


Figure 4.7: Physical observation procedure

Source: Author (2009)

ii) Scheduling for observations

The observation for JTAR was conducted during weekdays and weekends taking into consideration the pattern of activities and intensity of users at different times. A schedule of observations based on day and time is shown in table 4.3 below;

	Day	Time
Weekdays	Monday- Friday	8.00 am- 9.30 am 13.00 pm- 14.30 pm 17.00 pm- 18.30 pm 19.00 pm- 20.30 pm
Weekends	Saturday and Sunday	10.00 a.m-11.30 am 13.00 pm- 14.30 pm 18.00 pm- 19.30 pm

Table 4.3: Schedule of observation

d) Content analysis

Content analysis from statements, annotations and descriptions were gathered to inform the study of the issues, policies and strategies related to the study area. One of the sources is the government publications, such as Economic Transformation Plan (ETP), National Urbanisation Policy (NUP), Kuala Lumpur Structure Plan 2020 and National Physical Plan 2005. Reference was also made to the media in the form of local newspaper articles, Archive Department. Related reports on studies are also gathered from the Federal Department of Town and Country Planning (JPBD) libraries and resource centres. Statements from DBKL officials (Urban Design Units and Planners) with regards to the study area and issues are identified as supportive information to the research.

4.8 Data Processing

Data for the study was collected from both primary and secondary sources. The primary data came from the survey; interviews with the urban pedestrian users and site observation; visual observations of pedestrian behaviour in urban space, physical qualities and social qualities of the space. The secondary data were obtained from other sources such as articles, reports and other information. The data were processed using both qualitative and quantitative approaches and tabulated to find potential patterns and connections. The aim of these two methods being used together is to strengthen the findings and allow for a greater generalisation in the exploratory research through triangulation. The data collected (quantitative and qualitative) are independent of each other. Both are concurrently analysed to allow general patterns and the causal factors to emerge.

Data from the survey were analysed using the utilizing Social Science Statistical Package (SPSS) software program. SPSS was used for descriptive and inferential analyses to provide respondents' profile, relationships between variables and correlations. Descriptive analysis was generated from SPSS and presented in the form of tables and figures using Microsoft Word and Excel. Checklist and matrix format were used to sort the data. The idea was to seek for the hierarchy of each attribute and element of perceived preference levels of the street users.

The second set of data that was gained from the open-ended questions was analysed descriptively. However, the socio economic profile of the respondents was also used in the selection of the respondents for in-depth interviews so that the selected respondents

would be representative of the street users. SPSS statistical software was used to create a file containing the responses from each questionnaire. This package has the capability to perform statistical analysis as well as produce graphs and data summaries (Sisiopiku et al., 2003).The observational data were analysed to investigate the pattern of use in the street, both in terms of functional zones and type of behaviour setting. Data help explain the variations of use across different types of behaviour settings by the users and understanding special uses of the streets; how the layout, setting and features satisfies the users. The semi-structured interview was used to focus on scope that must be covered. This was used as a guide during the interview. The purpose of the interview was to clarify the meaning of the unexpected answers from the survey in the users' assessments of their preferences and needs attributes and characteristics in the streets. The tape recorder interviews were transformed into a written form. The next stage was analysing the transcripts. This was done qualitatively by coding the interview transcripts.

The results are presented in both quantitative (frequency/percentages/mean values), with the use of graphs and tables, and qualitative (statements and description) according to the aspects concerned in the study (Physical attributes activity and meaning). This was done to enable conclusions to be drawn from the data, identifying matching patterns (through recurring themes or categorising), clustering (grouping responses with similar characteristics and meanings), relating variables (identifying the relationship between two or more variables) and relating the findings to the theoretical framework of the study. Cross-tabulation techniques were used to investigate the correlation between variables. Chi-square tests were used to look at the significance between variables and socio economic backgrounds.

4.9 Conclusion

This chapter has presented the design of this research that embraced street users' approach in the study of a user-friendly urban commercial street in respect of Jalan Tunku Abdul Rahman (JTAR). It is the most important chapter in directing the process of the research. In identifying the reasons 'why' the street is not friendly to the users' four main steps were identified as crucial to the research. These included physical study, functional dimension, users' actual activities and needs, and users' perceptions. To identify these, a case study approach was adopted because it has been proven by many theories to be the best method for this type of study. Hence, by using case study, it will support the research in achieving the objectives one and two that relate to the context of a Kuala Lumpur street. The results are based on the use of mixed-methods with a variety

of research techniques in the data collection. This is relevant in achieving objectives that are related to the issues revealed in the research problem, not only from the physical dimensions but also from the functional and social dimensions. Therefore, the applications of the quantitative and qualitative approaches in the analysis would optimize the reliability of the data and validity of the findings. The choice of a combined approach is relevant to the topic and multiple factors involved.

The questionnaires constitute the quantitative technique used in this research. In social research, this technique has been widely used to identify users' needs and evaluation of the built environment. The sampling in this research is the users of the street in Kuala Lumpur city centre. The responses from different types of users and who are from different socio economic backgrounds in this research help to identify more detail concerning the similarities and differences of the factors and attributes that contribute to user-friendly streets from different perspectives of the users. It is claimed that the results from quantitative data can be hollow if not supported by other qualitative data. Therefore, in this research, in-depth interviews were used to complement the quantitative data. In this research semi-structured interviews were found to be the most relevant to get spontaneous answers from the respondents and also to allow further issues to emerge, which may not be addressed in the survey. By interviews the respondents can also relate their experience and attitudes that are relevant to their research in their own terms.

Field observation was the technique used to look at the physical and functional dimensions in the street. This technique is commonly used in most studies relating to the built environment and behaviour. Mapping activities and photographic documentation were used to identify the relationship between the physical characters of the street with users' activities in the street. Photographic documentation was used to get more accurate information concerning events during observation in addition to note taking. In this research, the observation technique is important in order to look at the actual physical environments, users' actual activities on the street and also the relationships between physical characteristics and users' activities on the street. The findings from this data will support and strengthen the findings revealed from the questionnaires and interviews.

The data from multiple research techniques are triangulated to find the convergence of the results. Triangulation is employed because each of the techniques employed has its own strengths and weaknesses that are able to compliment each other in research findings. The pattern that established in quantitative data analysis (questionnaires) will be

complemented by the qualitative findings. By using this approach, the data will be comprehensive in tackling the research problems in multi aspects and perspectives.

The next chapter will present the introduction of the study area (Jalan Tunku Abdul Rahman).

CHAPTER FIVE

INTRODUCTION TO THE CASE STUDY: JALAN TUANKU ABDUL RAHMAN

5.0 Introduction

This chapter presents the introduction of the study area. The purpose is to provide an insight into the physical characteristics and features of the street and the uses and activities that occur. This chapter also provides background information to the analysis that follows.

This chapter is divided into three parts. The first part provides a brief introduction to the city centre of Kuala Lumpur in connection with Jalan Tuanku Abdul Rahman and the urban design plan policy of the city centre. The second part discusses the physical characteristics. The last part presents the functional (uses and activities) and the users of Jalan Tuanku Abdul Rahman (JTAR).

5.1 The study area: Jalan Tuanku Abdul Rahman (JTAR) Kuala Lumpur

It is considered important to describe Malaysia briefly before introducing the study area. Malaysia, occupies an area of 329, 758 sq. km., and is located between latitudes 1 and 7 degrees north and longitudes 100 and 119 degrees east with Thailand to the north of Peninsular Malaysia and the Republic of Singapore to the south of Malaysia. Enjoying a tropical climate, Malaysia has warm and humid weather throughout the year. The population of Malaysia is 24.53 million which includes three main ethnic groups, namely, Malays (58%), Chinese (26%), Indians (7%) and 19% others (DoStM, 2003).

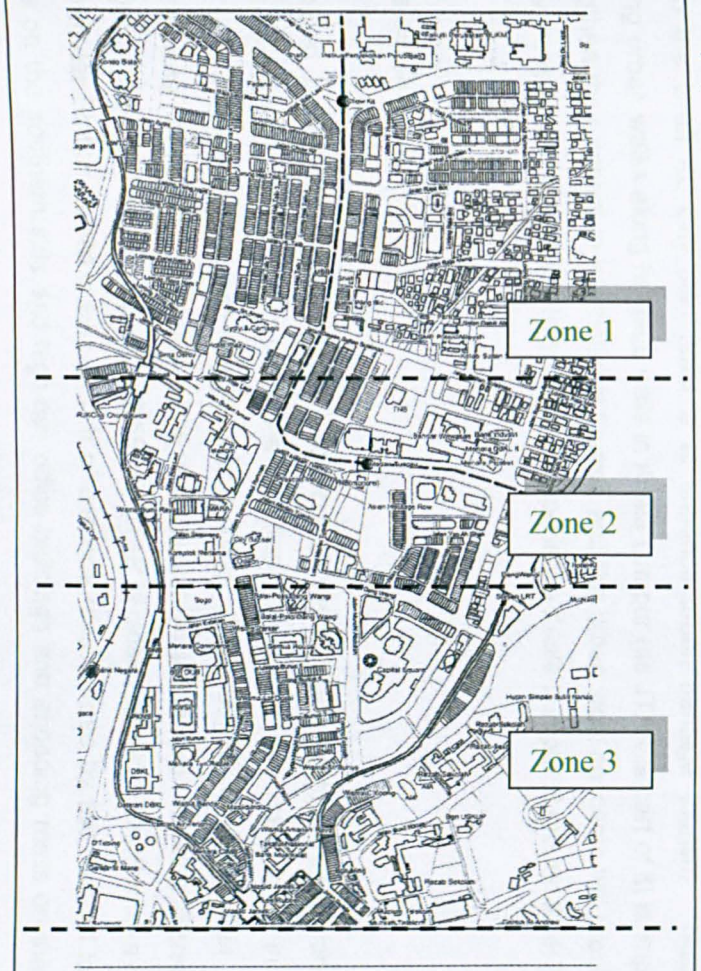
Figure 5.1: Kuala Lumpur City Centre
Source: DBKL (2008)

Background of case study

The study area, Jalan Tunku Abdul Rahman is located within the core of the Central Business District (CBD), of Kuala Lumpur. It is located within the city centre, which is a strategic zone that covers 1,813 hectares and is bounded by highways, namely Jalan Tun Razak from the east to the North, Mahameru Highway to the west and the middle ring road to the south. Jalan Tuanku Abdul Rahman is well known as one of the earliest routes in Kuala Lumpur and as one of the earliest traditional shopping districts in Kuala Lumpur (Abdallah, 2006). It was originally called Batu Road. It was named so because it began as a track leading to the village of "Batu", with its limestone caves and tin mines. The road is now named after the nation's first Yang di-Pertuan Agong (Paramount Ruler) (Arkib Negara Malaysia, 2001). By the 1930s, the swamps, rice fields and coconut estates around Batu Road were replaced by commercial development, which created one of the town's busiest streets. Historically, and still evident today, the owners, builders, traders and commercial operators along this road were an ethnically diverse group. There were Malays, Indians (Muslims, Sikhs and Hindus), Sri Lankans, Chinese and British.

JTAR was part of the early formation of Kuala Lumpur, which began in around 1859 (Ujang 2008). Jalan Tuanku Abdul Rahman was noted for 'shophouses', a typical character of the Malay urban settings in the nineteenth-century. The wood and 'attap

shophouses' of early Kuala Lumpur were replaced from the 1880's with structures of bricks. As the city grew, 'shophouses' were developed in groups with facades of unified designs. Such grouping arose from the need to provide covered pedestrian passages along the shops and from an understanding of scale and civic responsibility. The initial, simple design slowly became increasingly elaborate in the details and decoration. As the 'shophouse' unit came under the control of individual owners many have been and continue to be remodelled and replaced by larger buildings.



JTAR can be divided into three main zones-north zone, middle zone and south zone. The north zone street is normally known as the Chow Kit area (refer to photo and map). This area has many old and new 'shophouses'. 'Shophouses' such as these were already in existence in the Straits Settlements - Malacca, Singapore and Penang. A typical feature of the shophouse architecture is the five foot way or 'jalan kaki lima' (in the national language) to keep the pedestrians away from the roadway and to provide shelter against sun and rain.

The middle zone street is after the intersection of Jalan Sultan Ismail to the intersection of Jalan Dang Wangi where the high rise office tower and modern shopping complexes are located. The Medan Tuanku building and Odeon cinema are also located in this area.

The south zone also comprises 'shophouses' with a combination of historical and modern buildings. The high-rise buildings, in particular the shopping malls, is renowned for their entrances with platforms and open spaces. Rows of traditional houses and modern buildings define the street's function as a vehicular route as well as the pedestrian linkages. One of the spaces is the entrance podium of Sogo shopping mall, which faces the intersection of Jalan Hang Tuah and is adjacent to the Pertama Complex and Odeon Cinema. On the south side and adjoining the Coliseum building, Laman Tuanku Abdul Rahman was developed as a public space with public facilities.

Figure 5.2: Location of the study area in the context of Kuala Lumpur

5.2 Urban design and city centre area

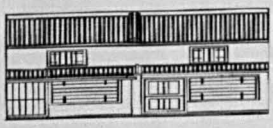
Kuala Lumpur is the city centre of Malaysia and has been turned into a 'world class city' by the city council. In respect of this issue, Kuala Lumpur is hoping form part of a global network and develops the credibility as a successful city that provides the benefit to the citizens, visitors and investors. The primary focus is to enhance the qualities for living, working and trading environment in Kuala Lumpur (Kuala Lumpur Structure Plan 2020). JTAR is one of the main shopping streets within the city centre that form and characterise the physical, socio cultural and functional characteristics of the commercial areas of Kuala Lumpur city centre. According to DBKL- JICA (1996), Jalan Tunku Abdul Rahman (JTAR) is identifiable a popular shopping street with the highest concentration of pedestrians, shoppers and tourists. In the Draft Kuala Lumpur Structure Plan 2020 (2003) it stated that this street will be further developed as a specialist shopping district, which will be upgraded to be more attractive and comfortable to the shoppers (DBKL, 2003). JTAR is defined as a traditional shopping street located within the historic inner city zone, which has been dedicated for urban revitalisation projects (DBKL, 2003).

One of the urban design issues raised in the structure plan report is the decrease in liveability as street levels damage social interaction and public use of the street. Creating streets for people is one of the aims of the Draft KL City Plan 2020 in moving towards 'people priority', in which people safety and comfort in travel and use of road space are taken into consideration. The KL City Plan 2020 stated that a few main issues need to be addressed concerning people's needs to create a world class city that promotes quality of living and a safe liveable and walkable city, with improved living standards and conducive physical environment. Another aim stated in the Draft KL City plan 2020 is to enhance urban heritage tourism. Therefore, enhancing urban walks along heritage trails in Kuala Lumpur (as JTAR is part of it) is important to strengthen their appeal to international tourists and the urban walk concepts will provide an alternative way for people especially tourists, to experience Kuala Lumpur at ground level (DBKL, 2003).

5.3 Physical Context

According to Bridge (2010), the physical aspects of the built environment cover land use patterns, transport systems public amenities and design features. The main focus in these physical characteristics is street design and building. JTAR begins at Jalan Tun Perak intersection and ends near Hospital Universiti which is located at the Jalan Pahang intersection. The length of this street is approximately 2.58 km. JTAR is closely linked to the Bandaraya LRT and Commuter Station. It has a long stretch of one-way road defined by two rows of low-rise buildings on the southern side and high-rise office buildings and shopping malls on the north

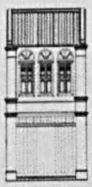
side. Within the study area, both sides have rows of commercial buildings, such as hotels, office lots, shop houses, bazaars, and restaurants. The emergence of modern office buildings and shopping complexes in the 1980's changed the street's landscape and the scale of urban form (Ujang, 2008). In addition to the old 'shophouses', new modern shopping malls have been constructed in the last few decades, which define the character of the place. Every type of commerce is still represented: retailers, wholesalers, restaurants, hawkers, hotels and movie theatres. The buildings along JTAR reflect the changing trends in architectural design. They provide clues as to the period of construction, such as the Utilitarian (1900s-1910s), Neo-classical (1910s- 1930s) and Art Deco (1930s- 1940s) styles and the various forms of post-war buildings (Ujang, 2008).



a. Early shop house

b. Neo classical

c. Eclectic style



d. Colonial style

Figure 5.3: Building facades

Source: DBKL (2004)

a) Chow Kit area

b) Chow Kit area

c) Sogo Mall

d) Shophouses

e) Coliseum theatre

f) Kamdar Department Store

g) Laman Tunku Abdul Rahman

h) Wisma Bandar

Figure 5.4: Building types

Source: DBKL (2004)

5.3.1 Physical Characteristics

Access and linkage

JTAR begins at the intersection Jalan Tun Perak and ends at the cross section near Hospital Universiti. It is also a one-way street where most vehicles access it from Jalan Sultan Ismail, Jalan Dang Wangi, Jalan Semarak and Jalan Isfahan. This road ends at the intersection of Jalan Tun Perak and Jalan Raja. Based on observation, there are eleven access roads along this street and one of the streets is for pedestrians only (Jalan Bunus), which is located near the Coliseum theatre building.

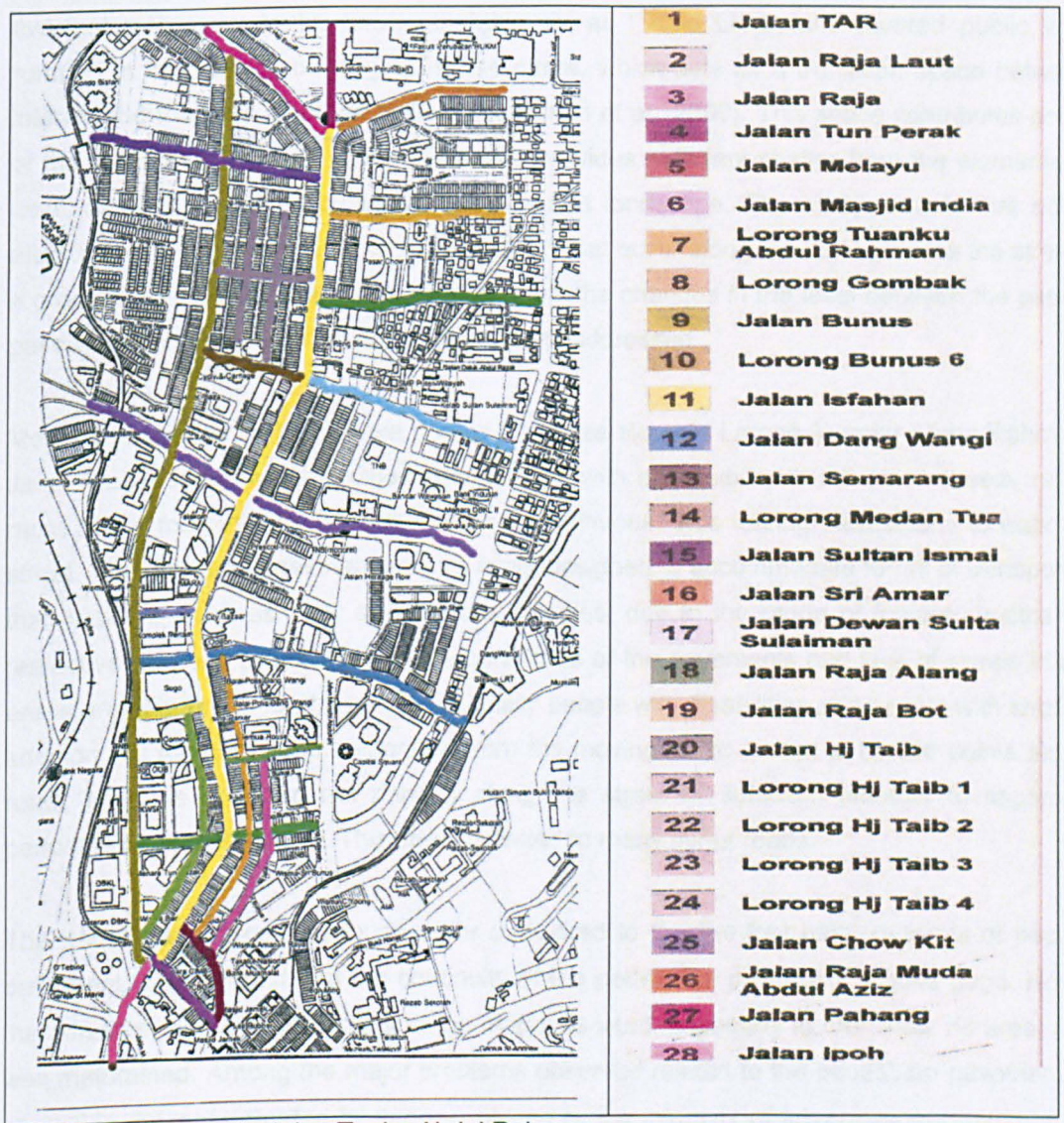


Figure 5.5: Access to Jalan Tunku Abdul Rahman

Source: Adapted from Selamat (2005)

Access for pedestrians by foot

The accessibility aspect can also be seen thorough the pedestrian linkage provided along the street, which includes the traditional five foot walk way or "kaki lima" along the old shophouses and open pedestrian walkway. JTAR has a continuous pedestrian network with a pedestrian footpath along the street although there are disruptions of the flow at several points. The width of the footpath varies from 1 metre to 6 metre. JTAR is highly accessible by walking as it is connected with nearby places of interest such as Dataran Merdeka, Bangunan Sultan Abdul Samad and other streets, such as Jalan Tun Perak and Jalan Parlimen. In JTAR, the pedestrian walkways are divided into two types a) the five foot walkways and b) pedestrian pavement. The five-foot walkways, better known in Malaysia as ' Kaki Lima', are covered public walkway running in front of the building along the street, which acts as a transition space between the interior and the exterior of the building (Sulaiman et al., 2009). This space contributes continuity of the pedestrian linkages along JTAR and provides sufficient shelter from the elements to the user, as well as adding character to the urban landscape. The study reveals that adequate attention was not given to the change of levels that occur along the "kaki lima" as the street is on a gradient following the landform. Neither were the changes in the level between the pedestrian pavement and the 'kaki lima' generally properly addressed.

Most of the shops in JTAR have double frontages towards Lorong Tuanku Abdul Rahman and Jalan Masjid India, which provides pedestrians with accessibility to the other streets, however, most of the footpaths in the alleys are not continuous, thus forcing pedestrians to walk on the street. The existing pedestrian network is not designed to accommodate forms of transport other than walking, such as baby strollers and bicycles, due to the range of footpath widths that is restrictive at many points. Hence, the conditions of the pavements and lack of ramps in certain areas are dangerous for the users, especially people with disabilities and people with strollers. In addition the footpath is not separated from the moving traffic except at certain points along the road. There is no on street parking along the street or sufficient planters to separate the pedestrians from the traffic. This street is linked to many minor roads.

The pedestrian walkway is much wider compared to the five-foot path. In terms of pedestrian pavement, it was found that the continuity of the pedestrian pavement is quite good. However, the condition of the pavements and the materials used, especially in the Chow Kit area, are not well maintained. Among the major problems observed related to the pedestrian pavement is the obstacles /hazards created by wrongly placed or the intensity of advertisement banners, street lighting, street furniture/ decorations and many others. This is especially so for the elderly, children and pregnant women.

Figure 5.6: Five-foot walkway ('kaki-lima') and pedestrian walkway in JTAR
Source: Case study (2008)

Access for transportation

It is evident that JTAR's accessibility is mainly for vehicular transportation based on its high volume of everyday traffic even though there are ample provisions for pedestrian facilities (Shamsuddin et al., 2010). JTAR has a high level of accessibility by private and public transport facilities such as LRT, bus and taxi, and is well provided with bus and taxi stations (Figure 5.7). Based on the site observation, JTAR has a very good connectivity based on the number of surface street intersections within the area (Institute of Transport Engineers, 2006). In JTAR, Jalan Dang Wangi which is located between Sogo Mall and Pertama Complex is only for public transport access- bus and taxi. In the Chow Kit area, there is a monorail trail and monorail station at the intersection of Jalan Pahang. The monorail crosses towards Jalan Sultan Ismail.

Figure 5.7: Location of the study area in the context of Kuala Lumpur

Source: Case study (2008)

Comfort

The Malaysian lifestyle reflects the climatic adaptation of the hot-humid climate (Abdul Rahman, 2004). Malaysia shares common climatic conditions with the rest of the Southeast Asia Region, which is hot and humid (Kumar, 2000). Malaysia generally has an equatorial monsoon climate, characterised by heavy rainfall, uniform temperature and high relative humidity (Jamil, 1996). The average daily temperature throughout varies from 21-33 degrees (Abdul Rahman, 2004; Jamil, 1996) and the average relative humidity of the area is high with a mean of approximately 85 -95% (Jamil, 1996; Tjia, 1998). During the day, the relative humidity varies between 55-70 % and at night it increases to 95% or higher over almost the entire country (Tjia, 1998). The winds in Malaysia vary in speed at ground level, and, according to Abdul Rahman (2004), almost 50% of the year the wind is as low as 0.3 m/s. During the case study survey in JTAR, the temperature in JTAR was 23-37 degrees Celsius, mostly cloudy and warm. The humidity level during the

study time was 80-84% and the wind speed level was zero to seven kilometres per hour. Malaysia only has wet and dry seasons. Normally, after rain, there is a sudden calm in weather conditions where there is no wind movement, which creates a feeling of discomfort due to the high relative humidity (Abdul Rahman, 2004).

In JTAR the sound of music and the presence of many people along the street together with the merchandise sell contribute to the sense of sociability. In respect of the cultural factor, most of the users are Malays. From the safety aspect JTAR can be considered as a safe area during the daytime because of the high numbers of users. However, at night, the street does not feel so safe, especially after ten o'clock in the evening when most of the shops and shopping complexes close. There are pedestrian crossings provided, which link both sides of the pedestrian walkways. However, in terms of practicality, the location, distance from one crossing to another and waiting time is not so good. Police posts are provided in a few places along JTAR, which contribute to the feeling of safety of the street users. In respect of greenery and tree planting along this street, it was found that the street lacks big trees for shade. However, in some areas along the street where the buildings are tall, self-shades are created along that area.

Physical characteristics of JTAR

This street has its own attraction in terms of architecture (the building facades and also historical buildings). The density of buildings can be seen based on the solid and void map of JTAR (figure 5.8).

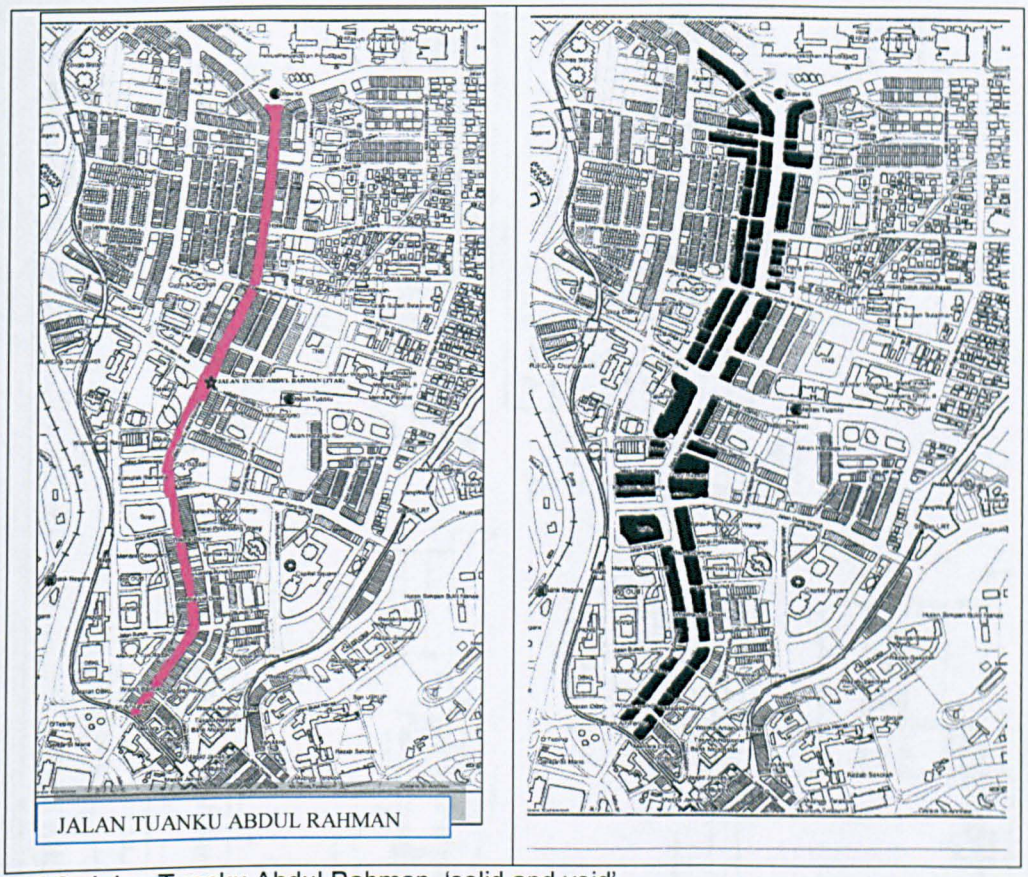


Figure 5.8: Jalan Tuanku Abdul Rahman, 'solid and void'

Source: Case study (2008)

The sense of enclosure quality in this street can be seen based on sections (Figure 5.9). In zone 1 and zone 2, the feeling of enclosure is relatively low with a ratio of 2.5: 1 (zone 1) and 2: 1 (zone 2). From section of zone 3 the sense of enclosure is slightly higher with the ratio approximately 1: 1. In zone 5, it shows an imbalance in the ratio with buildings on both sides providing a slight feeling of enclosure. The zone that shows the highest quality in terms of sense of enclosure is zone five , the area with old 'shophouses' (two-storey buildings) with a narrow street. In conclusion, the feeling of enclosure along this road varies according to the zones mentioned. The details of physical characteristics in Jalan Tunku Abdul Rahman are presented in Appendix 5.

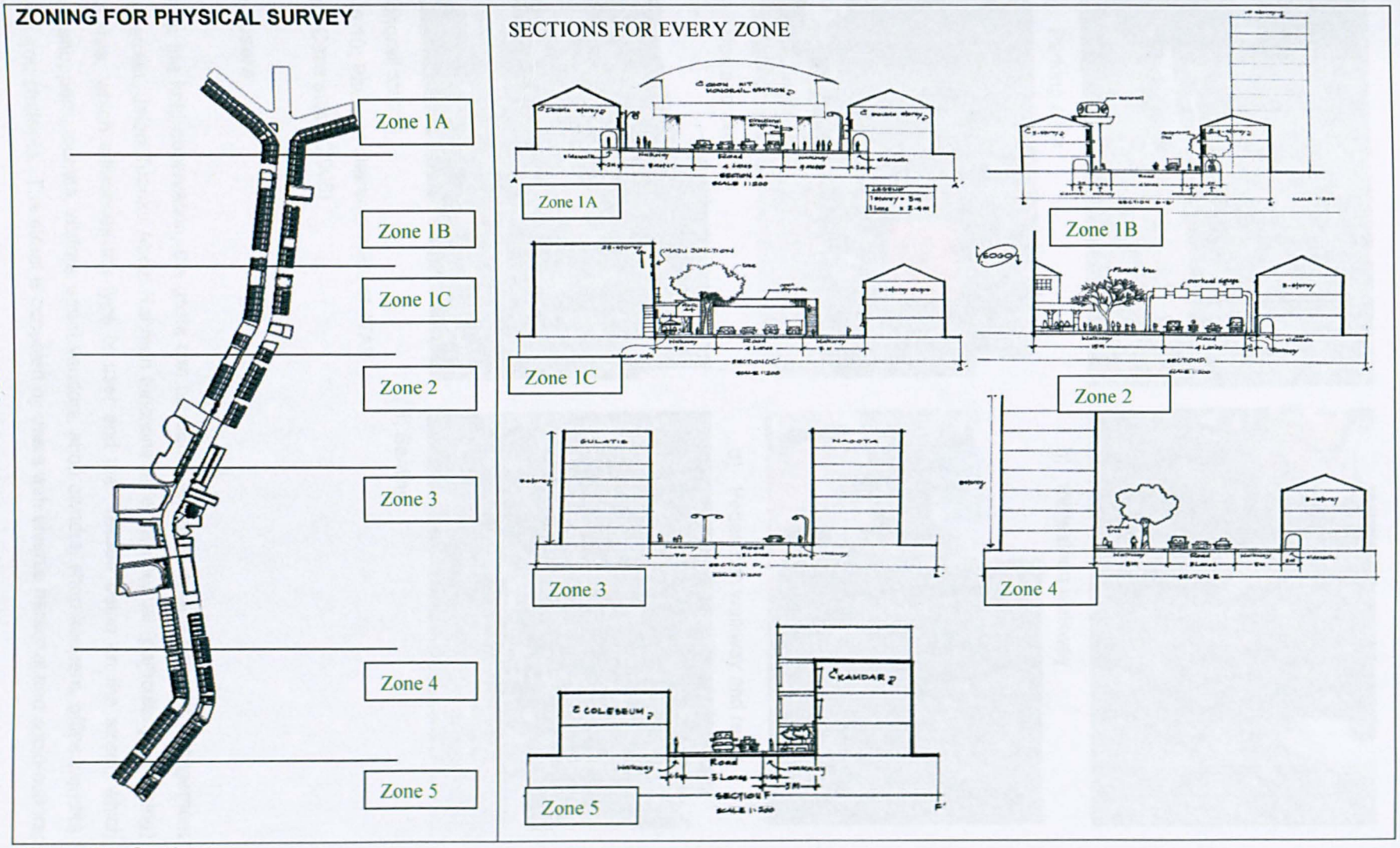


Figure 5.9: Sections

Source: Case study (2008)

a) Parking area

b) Pedestrian walkway

c) Bus and taxi stop

d) Pedestrian walkway and ramp

e) Monorail station

f) Seating

Figure 5.10: Physical characteristics of JTAR

Source: Case study (2008)

5.4 The users

Based on the field observation, the users can be identified based on the types of engagement with the street. Jalan Tuanku Abdul Rahman functions as a commercial (particularly shopping) activity area, which influences the type of user and their reason being on the street, which includes shoppers, tourists, visitors, street vendors, shop owners, shop keepers, office workers, residents and students. The street is occupied by users with diverse personal and socio-cultural

characteristics. The presence of immigrants, who originated from countries such as Indonesia, Bangladesh and India, have played their role in changing the image of streets, and apart from locals, the place is also a shopping destination for shoppers and visitors from others parts of the country.

5.5 The uses and activities

JTAR is regarded as one of the main traditional shopping streets in the city centre of Kuala Lumpur. In JTAR, 2-3 storey high old 'shophouses' reflect the Classical, Art Deco and Colonial architectural influence is disrupted by the low-rise (4-5) storey pre-war and post-war buildings. JTAR was developed after the earlier Market Street (Leboh Pasar Besar), Ampang Street (Jalan Bandar) and Pudoh Street (Jalan Pudu). These 'shophouses', as their earlier precedence along Market Street and High Street, were built to accommodate the mostly Chinese urban settlers who used the upper floor as their living quarters. The plan of the 'shophouses' are almost identical with the provision of a courtyard for ventilation and the variation is expressed in the treatment of the façade. 'Shophouses' such as these were already existence in the Straits Settlements- Malacca, Singapore and Penang. A typical feature of the 'shophouse' architecture is the five-foot walkway or 'jalan kaki lima' (in the national language) to keep the pedestrians away from the roadway and to provide shelter against the sun and rain (Yeang, 1992).

This street retains the character of the traditional streets due to the types of buildings that flank the street and the nature of activities that take place there. One of the major attractions of the street is the mixture of on street activities that create a sense of festivity due to the nature of trading operations, where bargaining is still practiced. JTAR reflects a street that responds to the tropical climate where the outdoors is used as part of the spill over space for displaying the merchandise. The shops and the goods sold occupy the sidewalks to the maximum, where clothing and scarves are displayed for sale. There are also kiosks and stalls placed on the street so that the street appears to be pulsating with human activity. In JTAR, the activities are more controlled and the sidewalks are free from mobile hawkers or petty traders. This street is slightly wider than the other two traditional streets and is acknowledged as being one of the most established shopping streets in Kuala Lumpur (Mijan, 2000).

Based on the Land Use Plan (DBKL, 2004) almost all the plots along JTAR are used for commercial activities. The main activity generators in JTAR are businesses and commercial activities with the dominant ones being textile shops and arcades (Shamsuddin et al., 2010). Along this road are located some of the well-known shopping malls in Kuala Lumpur, such as Sogo, Pertama Complex, Maju Junction, UDA Ocean, and Mydin. This street is also very famous for textiles and clothes shops, such as Kamdar and Globe Silk Store. In addition, there are other

high quality textile shops such as Euro Moda, Harissons and Maya Boutique. The streets are mainly surrounded by office buildings and banking centres, which promote the intensity of office workers in the area. The intensity of users is very high during the day time, especially at weekends and lunch time.

JTAR is famous for textile shopping activities with high quality and popular shops, such as Harith Silk Store, Euro Moda textile, and Kamdar. In addition, to textile products, this street is also well known as the "tudung" scarf district. Based on observation, the ground level of the buildings is predominantly occupied by commercial uses including textile, traditional costumes, jewellery, bookshops, food and restaurants, and communication service shops. The upper floor supports various uses including residential, offices, commercial spaces, hotels, educational and services. It was found that there are also many dilapidated 'shophouses' units on JTAR that are empty, particularly on the upper floor. Hence, most of the upper levels of Pertama Complex and MARA buildings are used for educational purposes such as the UniKL and MARA colleges.

All these commercial outlets in JTAR contribute towards the robustness and richness of the street where colourful clothes, fabrics and head scarves are hung along the pedestrian routes. All these items are also displayed along the pedestrian footpaths and the street. In addition, the Coliseum cinema adds to the mixed-use development of JTAR as well as the major shopping centres, such as Sogo and Pertama Shopping Complex. Another interesting feature in JTAR is the stalls operating in the nooks and crannies of buildings selling clothes, headscarves, newspapers and food. The uses and activities in JTAR are located in a compact and walk able area that contributes to the physical quality of the street.

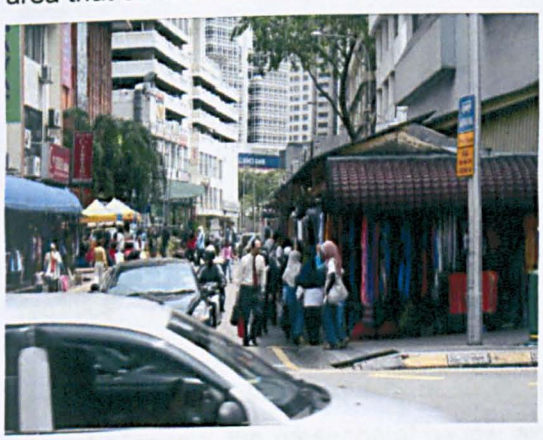


Figure 5.11: Activities in JTAR
Source: Case study (2008)

Human activities on the streets begin at eight in the morning when people are busy going to their workplace. JTAR becomes busier with activities from ten o'clock in the morning to twelve noon when most of the businesses start. The congestion is created by the market, which is located along the alleys. In the area of the shopping complexes, such as Sogo, Pertama and Maju Junction, human activity mostly starts at eleven and ends at ten o'clock in the evening. The foyer of Sogo mall and the street plazas along JTAR become chaotic after office hours. During weekends, most of the activities will start a bit later than the working days and the trade activities also operate later than weekdays.

The Coliseum Cafe is currently used as a cinema catering mainly for local films; the restaurant itself is the oldest in Kuala Lumpur and is famous for its steak. The architectural style of classical Doric columns, pediments and arched keystone are a reflection of the Renaissance Design. The high-rise buildings, in particular the shopping malls, are renowned for their entrances with platforms and open spaces. Rows of traditional houses and modern buildings define the streets function as a vehicular route as well as the pedestrian linkages. One of the spaces is the entrance podium of Sogo shopping mall, which faces the intersection of Jalan Hang Tuah and is adjacent to the Pertama Complex and Odeon Cinema. On the south side and adjoining the Coliseum building, Laman Tunku Abdul Rahman was developed as a public space with public facilities.

It is hard to measure the quality of sociability in a place unless you experience it. In JTAR, the sound of music, the presence of people along the street and activities on the street, especially the trade activities enhance the sense of sociability of the street. Figure 5.12 shows the major nodes of activity in JTAR. Users pattern of uses and activities are presented in Appendix 6.

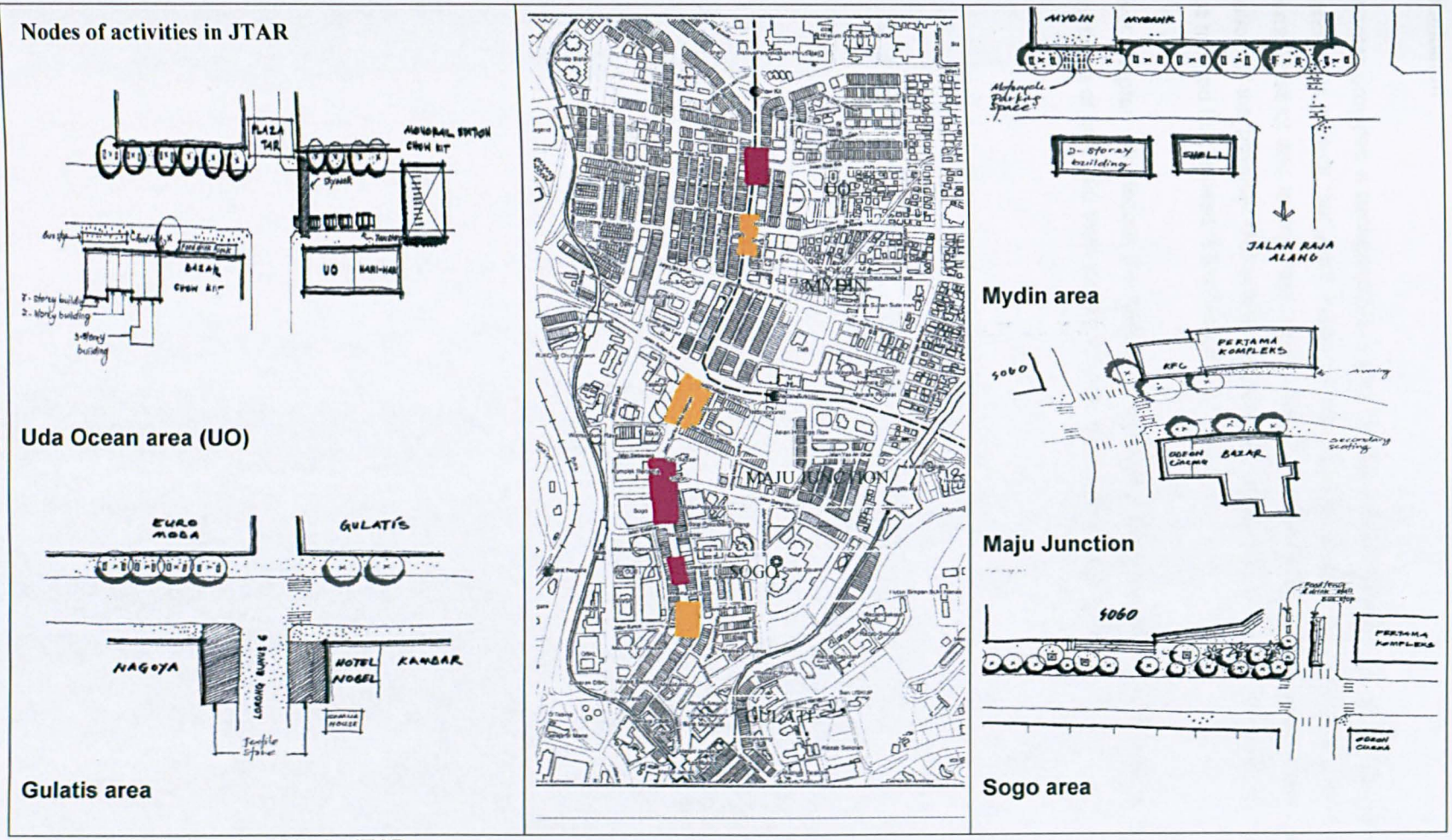


Figure 5.12: Nodes of activity in JTAR

Source: Case study (2008)

5.6 Conclusion

This chapter provides a background to Jalan Tuanku Abdul Rahman as an introduction to the study area. It is evident that Jalan Tuanku Abdul Rahman reflects the character of a city centre commercial district and is important as the main locus for shopping and trading activities. The information of the physical characters and features observed from this case study will support the next method that is used in this research.

The next chapter will discuss the factors that contribute to a user-friendly street according to different types of user and from variety of socio economic backgrounds.

CHAPTER SIX

USER- FRIENDLY URBAN COMMERCIAL STREET AND THE INFLUENCING FACTORS

6.0 Introduction

This chapter presents the findings of the analysis of data associated with the first and third objective of the research. That is (a) to identify the factors in the physical and functional context that make urban commercial street friendly to the users and (b) to determine the similarities and differences of a friendly street from different socio-demographic backgrounds. The findings draw upon the analysis of both the qualitative and quantitative data of the research. This research examines the factors contributing to user-friendly urban commercial street environment by analysing the users' environmental experience and activities of the urban commercial street environment in Jalan Tuanku Abdul Rahman (JTAR) in Kuala Lumpur city centre. The street environment is examined in respect of the physical and functional qualities through the analysis of the questionnaire surveys, interviews, and observations of the users' activities and physical environment of the street. The evaluation is achieved by cross analysing all these types of data. The physical and functional qualities were among the main criteria that contributed to a user-friendly urban commercial street. Even though, the social qualities are one of the criteria, it was not thoroughly studied in the research and will be suggested for further research. The justification of this limitation was explained under limitations of study in the conclusion chapter (Chapter 8).

In achieving the objectives mentioned above, all the data received from the survey were analysed using SPSS 2005 version 12.0 software. All the data from the survey were then organised into a data file, which contains the data of all respondents. The frequencies of all the variables from the data are shown in this sub-section, the cross tabulation between variables was used to look at any relationships between variables. The results from the interviews, physical observation and activities observation were used to support the results revealed from the questionnaire surveys. In this chapter, in order to ascertain the factors that contribute to user- friendly urban commercial street, the users actual activities and uses on street, the reasons and the main attraction of the street, how they use the street and why from the data survey were used. Triangulations were made within and between other data from observation of the physical characteristics and activities on the street, interviews and from previous researches in the literature review.

This chapter consists of five sections. The first section is the introduction to chapter six. The second identifies the respondents' profiles and socio-demographic backgrounds from different type of user. The third section discusses the factors that make streets friendly to the users. The fourth section discusses the variations between different socio-demographic backgrounds concerning how they use the street. The last section presents the discussion on the main findings of the research in association with the research objectives.

6.1 The respondents' profiles

This section provides an overall profile of the sample using descriptive statistics in terms of socio-demographic characteristics. A total of 346 respondents participated in the survey. Before the questionnaires survey conducted the respondents were broadly divided into two types of the user which are daily user group and occasional group (chapter 4, page 108). The respondents for daily group were selected based on systematic sampling method which is based on the interval of unit spaces on the ground level of the JTAR (chapter 4) meanwhile for occasional group the respondents were selected from the residential areas within the boundaries of the Kuala Lumpur city centre. This is to ensure that the respondents are familiar with the street being studied. The details of the selection of the respondents for this survey were explained in Chapter 4 (Methodology chapter). However, after the questionnaires, three types of user were identified. The types of user in this research were categorised based on their pattern of usage of JTAR as determined from the respondents' feedback from in the questionnaires. Based on the feedback it was found that out of 346 respondents, most of the respondents were daily users (those who are constantly engaged with the street) (49.1%) followed by occasional users (34.4%) and non-users (16.5%). The non-users in this research mean that they were users of streets in Kuala Lumpur city centre but never used the street studied which is Jalan Tunku Abdul Rahman (JTAR). In this research, the feedbacks from the non-users were also taking into account. Even though, the percentage is small, the feedback from the non-users group was also important in order to determine the reasons for not using the street and their perceptions of a user-friendly street. The information from all groups will also help in investigating the relationship between the uses of the street with the socio-demographic background.

In this survey, the majority of the respondents were male (60%). The male respondents show more interest to answer the questionnaires given compared to the female respondents. The cultural background and safety awareness might have contributed

towards the unwillingness to answer the questions. The results indicate that most of the respondents were between the age group of 26-34 (39%) and 18-25 (35%) (Refer to the table 6.1). This is because most of the residents in the urban area are people within that age group. In terms of marital status, most of the respondents were single (refer to Table 6.1).

In respect of ethnic background, the respondents were mainly Malay, Chinese, and Indian. This is because most of the activities and facilities provided along this street cater to the needs of the Malays, which is in keeping with the early settlement of the Kuala Lumpur urban areas especially around JTAR, which was by Indian Muslims and the Malay population (Ujang, 2008). This has influenced the socio-cultural characteristics and dominancy of particular groups living and working in this area. It was also supported by the statement by respondent 13; *"JTAR is more for Malays because it sells more Malay stuff, for Chinese they go to the place that caters for them" (Female)*

A lower number of Indian respondents were recorded. This is contributed by the users' unwillingness to participate, and, in many cases, a lack of familiarity with JTAR. Out of 346 respondents, only 282 of them were willing to give information about their income. The majority of the respondents that answered are within the monthly income group of RM 1000- RM 3000 (refer to table 6.1). In terms of respondents' level of education feedback, 36 per cent were college and institution followed by secondary school leavers 33.1 per cent, 27 per cent were university education level, 2.6 per cent were primary education leavers and the remaining 1.2 per cent were non-academic qualification. They were mostly attached to the private and government sectors (refer to table 6.1).

In terms of the distance from respondents' residence to JTAR, most of them stayed within 5-10 km of JTAR (Refer table 6.1). This shows that, currently, people do not use the shophouses as their place to stay. This was found from the results of observation in JTAR in which most of the shophouses along JTAR were only for traders (commercial) and offices. The upper floors which in the early era were mainly residential, where now found to be dilapidated. This was also supported by Ujang (2008) in her research towards place attachment in JTAR. In this survey, the question concerning the length of engagement with JTAR was asked of the daily users. Length of engagement in this research is related to how long the users were already engaged with JTAR. The result from the survey shows that for daily users, most of the respondents that answered the survey (46.8%) had been engaged with JTAR for about 1-5 years. The least response was received from the group of users who had been engaged with the street for less than

a year (refer table 6.2). This was due to their familiarity with JTAR. In this research, in order to avoid biasness in sampling, the results from other methods (interviews, observation on physical, uses and activities on the site) were used.

		Respondent (N= 346)
Demographic Profile	**Category**	**Percentage (%)**
Gender	Male	60.2
	Female	39.8
Age	Under 18	2.9
	18-25	35.5
	26-45	39.0
	46-59	19.7
	Above 60	2.9
Marital Status	Single	65.1
	Married	34.9
Ethnicity	Malay	62.4
	Chinese	24.7
	India	12.1
	Others	9.0
Monthly Income	Below RM 1000	4.6
	RM 1001- 3000	77.7
	RM 3001- 6000	15.2
	RM6001- 10000	1.8
	Above RM 10000	0.7
Occupation	Unemployed	20.1
	Self employed	8.0
	Private	33.3
	Government	32.8
	Others (student)	5.7
Distance from residence	Less than 1 km	0.6
	1-5 km	22.9
	5-10 km	36.6
	10-15 km	9.7
	15-20km	9.7
	More than 20 km	20.6
Education	Non-formal education	1.2
	Primary Education	2.6
	Secondary education	33.1
	College or Institution	36.0
	University education	27.0

Table 6.1: Frequency analysis of respondents' demographic characteristics

Source: Field survey (2009)

Length of engagement	Frequency	Valid Per cent (%)
Less than 1 year	1	0.6
1-5 years	80	46.8
6-10 years	25	14.6
11-15 years	32	18.7
More than 15 years	33	19.3
Total (N)	171	100.0

Table 6.2: Frequency analysis of length of engagement in JTAR for daily users

Source: Field survey (2009)

6.1.1 Results of socio-demographic backgrounds from different types of user

This section provides a profile of the sample of using descriptive statistics in terms of demographic characteristics from different types of user. As mentioned in section 6.1, out of 346 respondents, 49.0 per cent of them were daily users, 34.0 per cent were occasional users and 17.0 per cent were non- users. It was found in the results that the majority of respondents in each group were male. The feedback shows that for all categories of user, there were more males than females that responded to the survey (refer to figure 6.2). Therefore, in order to reduce the biasness, other types of data were used.

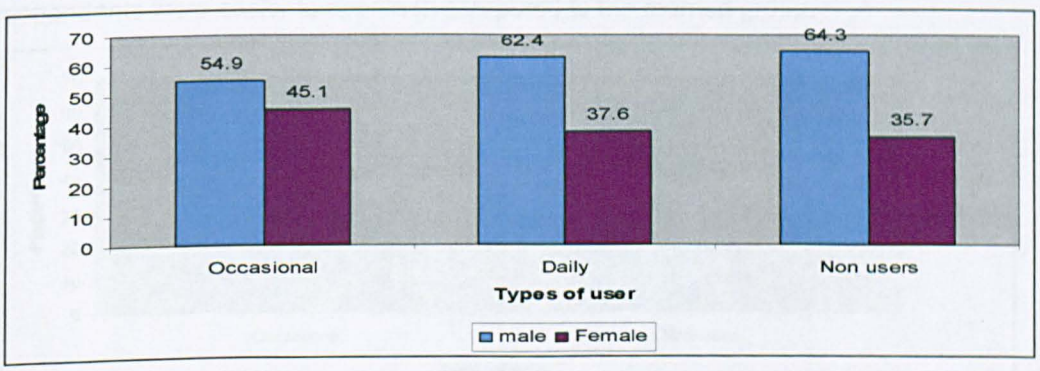


Figure 6.1: Frequencies of gender within the type of user

Source: Field survey (2009)

Based on the results of the cross tabulation between the type of user and age group, it shows that for the age group above 60 years old the majority of them were daily users (80 %) (Refer figure 6.2). It was shown that most of them were the group that live and work in JTAR, especially as shop and restaurant owners. This shows that a very small percentage of the elderly group use JTAR while were 30 per cent of the respondents in the group under 18 years old were non-users. The group of respondents aged 26 and above were mostly from the daily users group. The majority were working, doing

business there, and using the street as a source of income and some stayed there. The result from the cross tabulation between type of user and age group shows that this street is only popular for certain age groups and not for others.

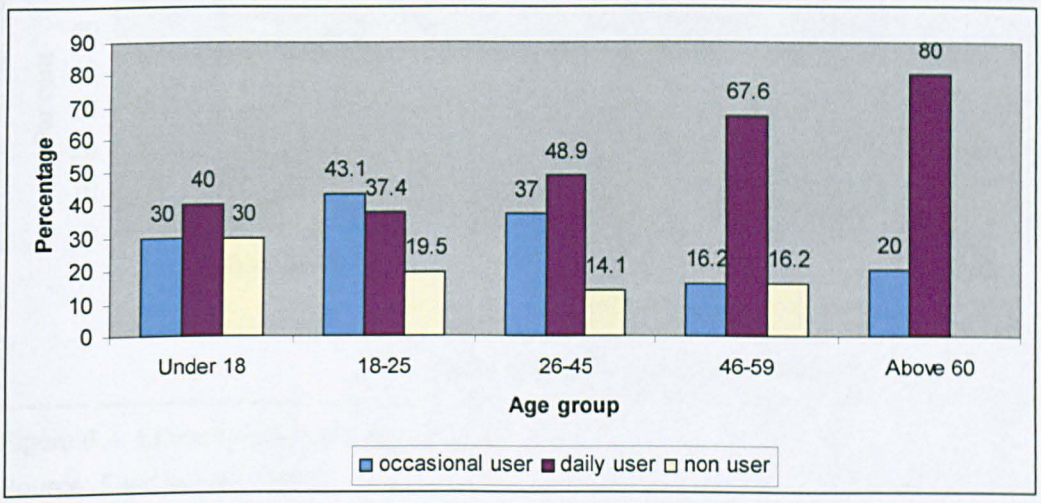


Figure 6.2: The relationship between the type of user and the age group of respondents.
Source: Field survey (2009)

The survey of the status of the respondents from the group of occasional and non-users shows that most of them were single (figure 6.3). This was because the single respondents were easier to approach compared to the married group.

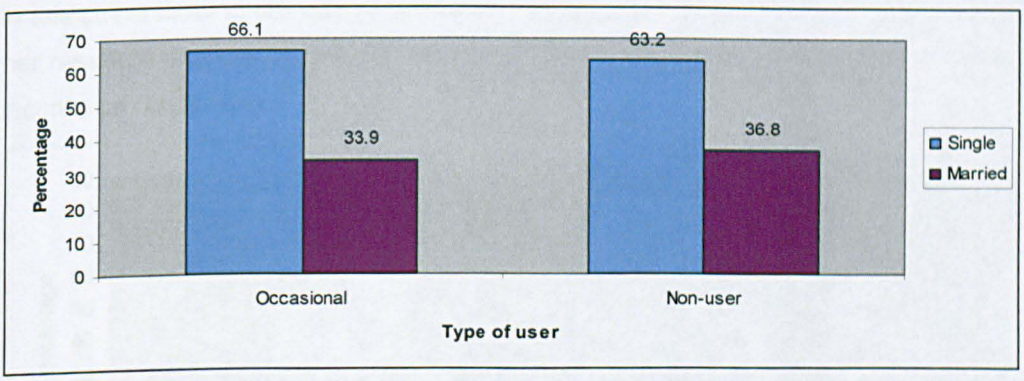


Figure 6.3: Status of the respondents within the type of user
Source: Field survey (2009)

In terms of ethnicity, the results from the survey show that the majority of the users are Malays (Figure 6.4). This is contradict with the ethnic classification of the population of Kuala Lumpur (Government of Malaysia, 2000) which the majority is Chinese (43%), followed by Malays (38%), Indians (10%) and others (9%). This is due to the nature of trading activities in JTAR that are actively participated in by this ethnic group.

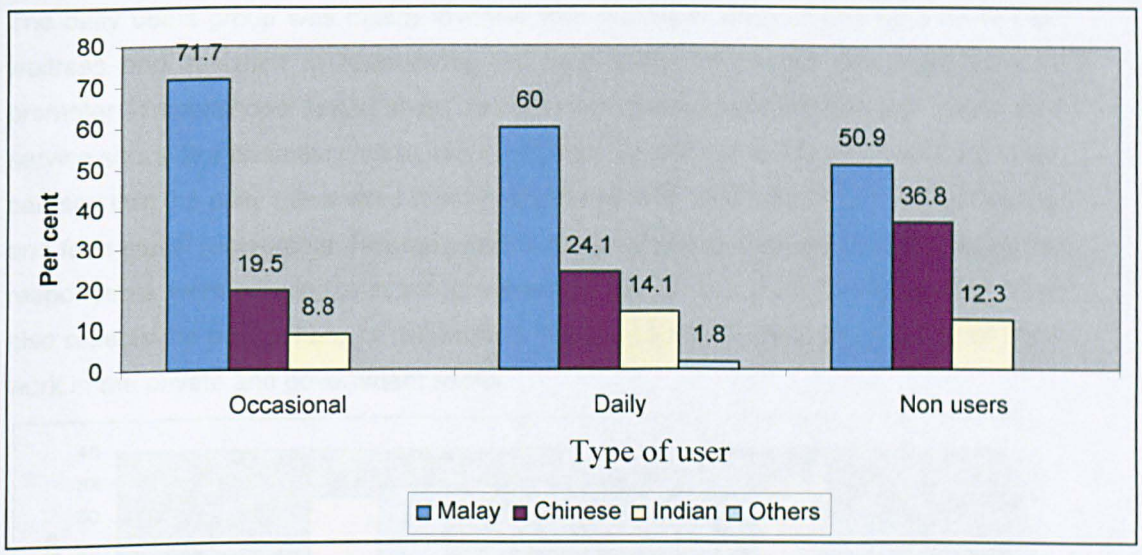


Figure 6.4: Ethnicity within the type of user

Source: Field survey (2009)

Based on the survey, it was found that all of the occasional users were from the group of income within RM1000 to RM 6000, and a variety of income groups came from the daily users (figure 6.5). The results for monthly income between these three types of user showed a similar trend, with most of them being in the range of RM 1000-RM 3000. This street was popular with the middle-income group and the facilities and products available in this street cater to this group of income. The statement is supported by Ujang (2008) in her research that identified that most of the products are particularly for low and medium income group of users.

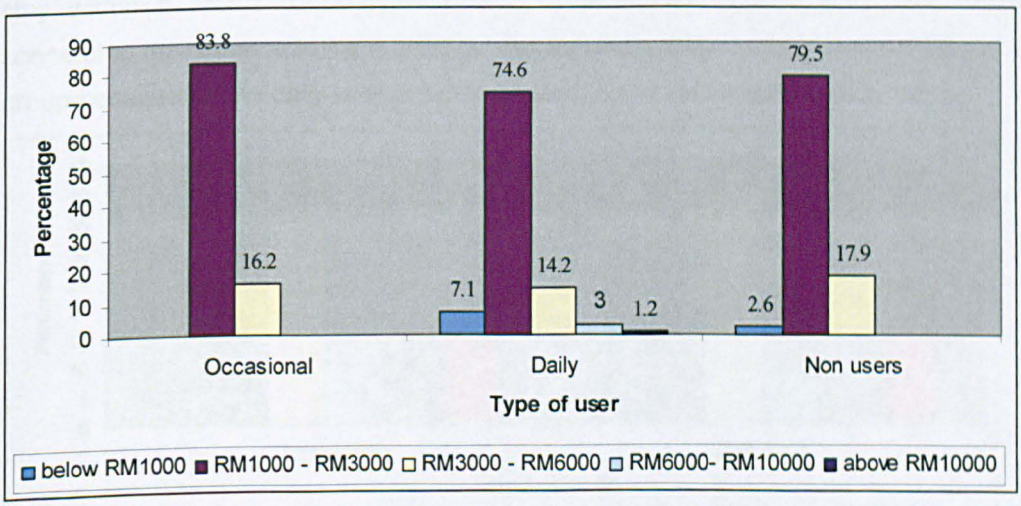


Figure 6.5: Monthly income within the types of user

Source: Field survey (2009)

The daily users group was mostly involved with business along JTAR, such as owner, waitress and assistant in restaurants and food stalls; the owner, shop assistant or promoter in bookshops, textile shop, carpets and shopping complexes; and work with service shops like pharmacy, clinic, tailor, cobbler; workshop; and taxi driver. In short we can say that the daily users were mostly associated with transactions of textiles, clothing and food stalls/ restaurants. However for the occasional and non-user group most of the respondents were working with the government and private sectors (Figure 6.6). This also reflects the occupations of residents in the city centre in which the majority of them work in the private and government sector.

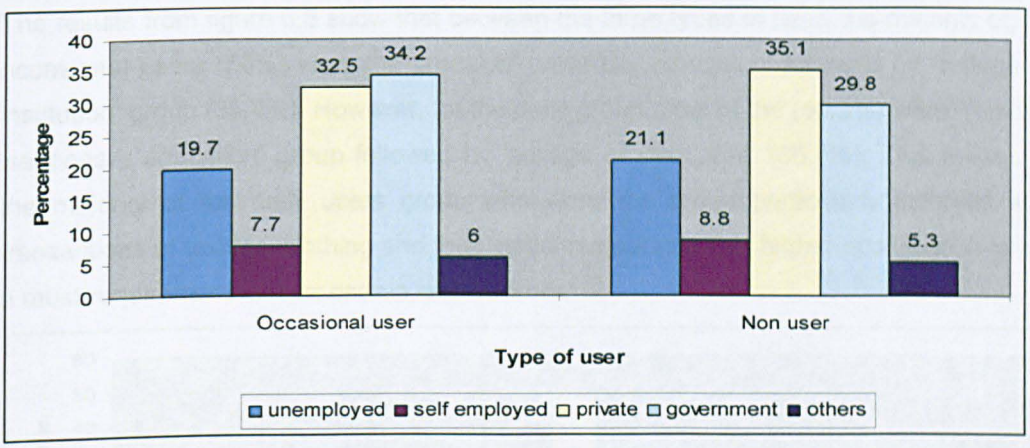


Figure 6.6: Occasional and non-users' occupation within the type of user
Source: Field survey (2009)

In terms of distance from residence, the results from the survey show that the majority stay within a radius of between 1 and 10 kilometres (Figure 6.7). The question concerning the distance to the residence was only asked for the occasional and non-user group because for the daily user group they used the street for essential purposes.

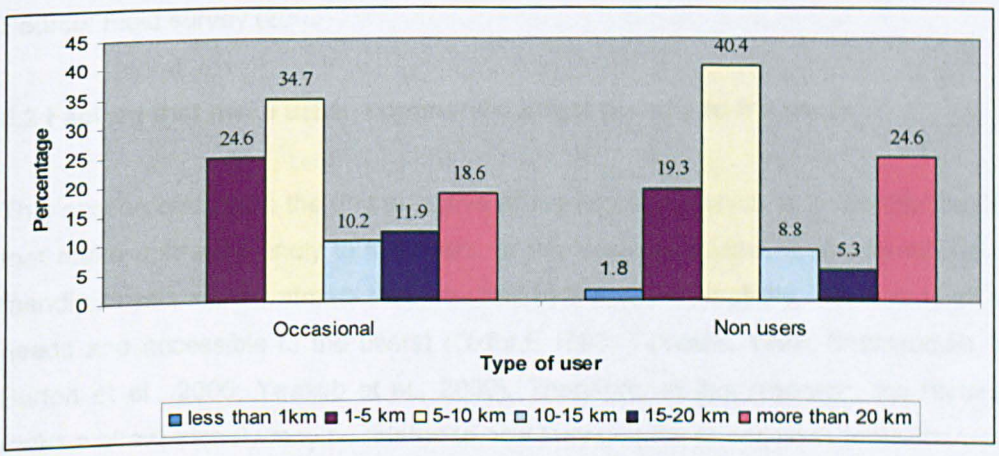


Figure 6.7: Occasional and non-users' distance from residence

Figure 6.8 shows that most of the occasional users were from the group of "university education" followed by "college or institute", however, the daily group were mostly the group of "secondary education" and "college and institution" group. This shows that different levels of income have different needs and preferences for the street. This may affect the way they use the street and which street they use most. As for JTAR, the street was surrounded by many office lots and institutions that give the percentage of respondents from the group of 'university education' and 'college or institute' higher that others in this survey.

The results from figure 6.8 show that between the three types of user, the majority of the occasional users (50%) were the group 'of university education' followed by 'college or institution' group (36.4%). However, for the daily group most of the (50.3%) were from the 'secondary education' group followed by 'college or institution' (35.5%). This relates to the majority of the daily users group who were the group particularly involved with transactions of textiles, clothing and food stalls/ restaurants that higher qualification is not a must requirement for that certain level of work.

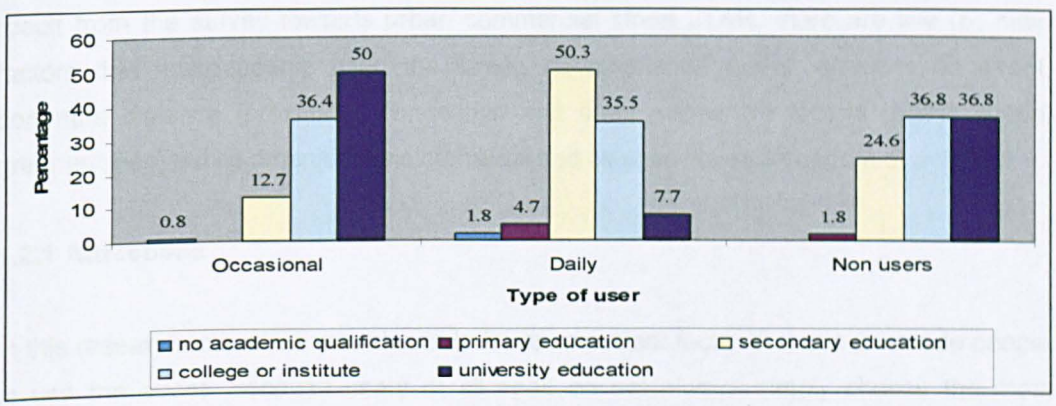


Figure 6.8: Level of education within the type of user group
Source: Field survey (2009)

6.2 Factors that make urban commercial street friendly to the users

This section discusses the first objective of the research, which is to identify the factors that make a street friendly to the users. In the literature review, it was found that user-friendly streets are the streets that are used by the users (usability, inclusive to all users' needs and accessible to the users) (Oxford, 1993; Tibbalds, 1992; Shamsuddin, 2000; Burton et al., 2006; Yaakub et al., 2009). Therefore, in this research, the factors that make a street friendly may be related to how they use the street, what make them use or not use the street, and what would encourage people to use the street more? Based on

the literature review, a friendly street is associated with the physical, functional and social dimensions of the street (Chapter 3). Even though, the social dimension is one of the important dimensions that contribute to user-friendly street, it was not thorough study in this research (refer to chapter 8).

A review of the literature on friendly streets indicates that the degree of friendliness and form is influenced by many factors (chapter 2 and 3). These factors were used as a bench guide in this study. The factors influencing the use of the street come from two aspects- physical factors and functional factors. As mentioned in the literature review, to evaluate a user-friendly street, it is important to examine the actual uses and activities and their preferences towards the street. This can determine the factors that contribute to the uses of the street which relate to how friendly the street is to the users.

In this survey, respondents who are relevant to answer these issues concerning the uses of the street are the occasional groups. This is because the way they use the street and the factors that attract them to use the street are different from daily users. Based on the result from the survey towards urban commercial street JTAR, there are five (5) main factors that make people used the street; attractions on street, activities on street, commute distance (proximity), congestion and other supportive factors (public space, greener/trees, public amenities, maintenance and cleanliness and freedom of actions).

6.2.1 Attractions

In this research, attraction was shown to be an important factor that can persuade people to use the street. Because users of all ages do not always simply choose the most obvious route to reach their destination, they are also influenced by how interesting or dull each route is (Gehl, 2000). This is also supported by Tibbalds (1992), who stressed the importance of attractive public spaces in urban areas in producing the feeling of comfort or well-being to the users. The survey of street users in Kuala Lumpur city centre shows that the main reason they did not use JTAR was because the street was not attractive to them (Figure 6.9). Based on the questionnaire survey the main reasons they do not use the street are because the street was not attractive (38%), followed by the distance from their residence (17%), 15% were because they were unfamiliar with the street, 13% do not use the street because the road is congested with people and motorists. This was reflected by the comment of respondent no18:

"In terms of attractiveness in JTAR out of ten, I give it 3 to 4 only". (Respondent 18: male)

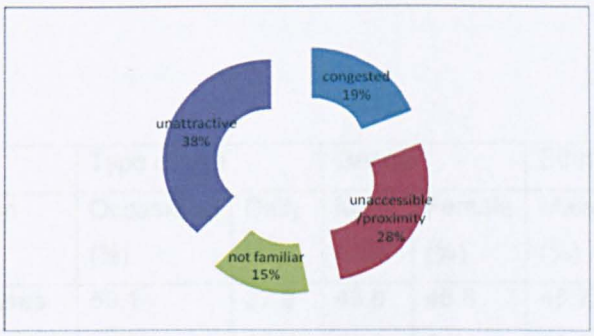


Figure 6.9: Reasons for not using JTAR

Source: Field survey (2009)

Attractive can be categorised in terms of physical, social and cultural (Gehl, 2000; Plowden, 2001). It is strongly associated with the mixed use of streets, variety of activities and good places with buildings and architectural features (Gehl, 2000). The results from this study show that functional factors were the strongest form that contributed to the use of the street rather than physical factors. Based on the survey, the functional attractions according to the occasional and daily users in JTAR were shopping centres and the best place to earn money. It was proven in the results on occasional users' and daily users' feedback that the main attraction of JTAR that make them use the street, especially for occasional users, was the shopping centres (46.0%), which tallied with the main role of the street as a shopping and commercial street (Table 6.3). The finding also supported by the feedback from gender, age and ethnicity group who also indicated that the shopping centres as the main attraction for them to use the street. As for age group of users the group age within 26-45 years old show the highest respond towards 'shopping centres' is the main attraction that makes them used JTAR (table 6. 4)

Based on previous research in JTAR by Abdallah et al. (2008), they also found that the activities along the street were mentioned as the most distinctive feature of JTAR. This also supported by Ujang (2008) that, the street is a traditional shopping street for Indian Muslims as it has many Indian and Malay businesses. The results from the survey indicated that the Indian and Malay groups of users are the groups who mention the shopping centre is the main attractions of JTAR (table 6.3). This is proved by the result from observation on site where most of the people, especially the Malays and Indians, came to this street for shopping. The numbers of Malays and Indians will increase during festive seasons especially for preparing for the Eid festival (celebration for Muslims) and Deepavali (celebration for Hindus) (Figure 6.10). Consequently, when the time of this festival is approaching, JTAR will move into high gear with lots of people on the streets and many trade activities.

	Type of use		Gender		Ethnicity		
The main attraction	Occasional (%)	Daily (%)	Male (%)	Female (%)	Malay (%)	Chinese (%)	Indian (%)
The shopping centres	59.1	37.9	43.6	46.6	45.7	38.7	50.0
The best place to earn money or income	18.3	37.7	22.7	24.1	22.3	27.4	21.9
The public facilities	7.0	14.8	12.7	11.2	10.9	9.7	21.9
The public spaces, buildings and landscapes	13.2	13.3	11.1	18.1	21.1	24.2	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 6.3: The main attractions in JTAR by different groups of users

Source: Field survey (2009)

Figure 6.10: Street environment during Eid festival

Source: Field survey (2008)

The second attraction of this street is as a place to earn money. The result shows that 'the best place to earn money or income' is the main attraction for daily group of users, group of users below 18 years old and above 60 years old. This is supported by observation on site where there are many youngsters work as shopkeepers in textiles and clothes shops, bookshops and communication services shops. As for the group of users above 60 years old, many of them are the shop owners of the shop houses there (such as textiles, bookshops and restaurants). In addition, JTAR is also surrounded by

mainly office buildings and banking centres that promote the intensity of office workers in the area. This activity is a necessary activity (Gehl, 2010).

	Age group				
The main attraction	Below 18 years old (%)	18-25 years old (%)	26- 45 years old (%)	46-59 years old (%)	Above 60 years old (%)
The shopping centres	28.6	45.0	50.4	42.6	23.3
The best place to earn money or income	42.9	19.0	25.6	18.5	33.3
The public facilities	14.3	12.0	8.5	14.8	33.3
The public spaces, buildings and landscapes	25.2	24.0	15.5	24.1	10.1
Total	100.0	100.0	100.0	100.0	100.0

Table 6.4: The main attractions in JTAR from different age groups

Source: Field survey (2009)

Apart from shopping and being the best place to earn money and income, the physical environment, such as the public spaces, buildings and landscape also contributes as one of the attractions in JTAR (table 6.3). The results show that main physical attractions in JTAR to the users are public facilities and public spaces. These kinds of attraction are related to 'the feeling of relaxation', leisure and aesthetic value (Jacobs, 1996; JPBD, 2003).

It was found in the survey that different groups of user are attracted to JTAR for different reasons. Based on the Chi-square test, the results between the type of user and their attraction to JTAR show a significant difference (Table 6.5). This is because their intentions and reasons for using the street, as well as their activities and how they use the street may affect their attraction to the area. However, apart from shopping centres, others attractions are very consistent between daily and occasional users, which means the others attractions were not significantly different.

Variables	Test	Result
Type of users	Chi-square	χ^2= 33.559, df=12, p= 0.001

Table 6.5: Chi-square test on the main attraction to JTAR

Source: Field Survey 2008

The majority of the occasional users indicate shopping as their main attraction to JTAR (59.1 percent). This is supported by the observation survey of the respondents' activities which show that most activities were centred on shopping centres, working and office areas. However, attraction is subjective to all users. There are certain factors that make it attractive to certain groups but not to others. According to Tibbalds (1992), "popular and attractive urban areas tend to be those in which a contextualise approach has been prevailed". The results show that for daily users, instead of shopping and a place to earn money the public facilities and public spaces on JTAR are also the main attraction there. This indicates the significance of shopping streets in supporting the economic and social activities. Unlike the occasional group, the daily group indicated the physical environment public facilities and public spaces-as another attraction of JTAR.

For occasional users, their attractions to JTAR were most specifically for the shopping centres and as the best place to earn money and income. The familiarity, time spent, and frequency of visits to JTAR were different between the occasional and daily users, which meant that their criteria of attraction towards the place were dissimilar between each group. Daily users were the group of users that used the street daily with duration of stay there; therefore they used more public facilities, public spaces and were more concerned with the physical environment. As for Chinese group of users, 'public spaces, buildings and landscapes' along the street are one of the main attractions to them. However, compared to three groups of user under ethnicity, the Indian group of user indicated that public facilities along the street are more important as the attraction of the street than the 'public spaces, buildings and landscapes'.

In the age group of users, the result highlighted that the group of users age 'above 60 years old' indicated 'the public facilities' as one of the main attraction that make them used the street. This is related with their safety, ease of activity and mobility on street. As per Turel et al (2007) stressed that for the elderly group of users, these factors must be taken into consideration.

Attraction or desirability is related to the qualities engaged with by the eyes, aesthetic values and entertainment quality (KLCH, 2003). It was shown that buildings and landscapes do not play a significant role as the attractions to this street. However, based on the results of the percentage of the attraction of JTAR for daily users', instead of these two factors, the other facilities and environmental factors also contribute to the important criteria as an attraction to JTAR. Even though the buildings and other physical elements

were not the main attraction in JTAR and received relatively low response in the survey, these elements were mentioned as the attractions by respondents in interviews as the attraction of JTAR. The architecture and character of the buildings and the landscape of the area attract them to use the street. However, there was a conflict between attractive and crowding in a place that causes the feeling of uncomfortable and unsafe. According to Whyte (1988, p.173), *'planners sometimes worry that a place might be made too attractive and thereby overcrowded'*. The results of the survey also show that there were slight difference in the way people judge the street to be attractive or not between different ages and income groups. The majority of the non-users that stated that the street was unattractive were the age group 18-25 (44.4%). This shows that the facilities and goods that are provided along JTAR may not be suitable for this group to make the street interesting to use and walk around. The group of income (RM1000-3000) (84.6%) mostly comprised the non-users that mentioned the unattractive factor as the main reason why they do not use the street. Therefore, attractive may be defined differently by different income group.

In summary, in urban commercial street (JTAR), the shopping centres and places to earn money are the main attractions that make users used the street, however, physical structures such as buildings and public spaces and public facilities and landscape elements were the supportive attraction to them. In addition, the other physical attractions that were mentioned that attract them to use the street were the buildings. Even though, the results of the survey concerning these two elements were relatively low compared to others it was evident from the interviews that the qualities that engaged with eyes, such as the landscape (greenery) and buildings character did act as elements of attraction in the street. The ratio of the street width to the height of the buildings which enclosed them is one of the consideration for good street which according to Moughtin (1992), the streets are considered attractive in the townscape if the street is narrow with the walls slightly higher than the street width that are continuous along the street. However, in this research it was found that, the users were more attracted to functional elements rather than physical elements. Familiarity, time spent, and frequency of visit in JTAR were different between the occasional and daily users, which mean that their criteria of attraction to the place were not similar. Daily users were the group of users that used the street daily with long duration of stay there; therefore they used more public facilities, public spaces and were more concerned about the physical environment.

6.2.2 Activities on street

The reasons for use may affect the activities on the street. The results from the surveys and in-depth interviews indicate that in the context of JTAR, the functional factors were the main factors that influence the use of the street. This street indicates a significant function in supporting the economic and social activities.

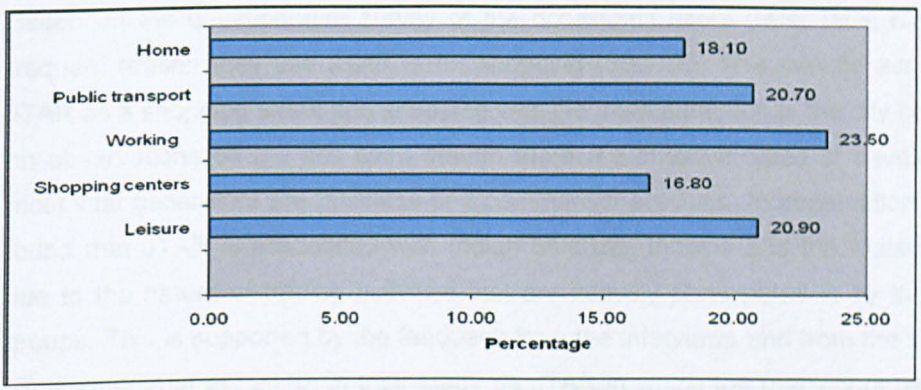


Figure 6.11: The reasons of using the streets in Kuala Lumpur.
Source: Field survey (2009)

Users' activities on the street were very much dependent on their reasons for using the street and also concerning the quality of the environment (Gehl, 2010). Meanwhile, the differences concerning how they used the street were affected by the types of activity and the reasons they used the street. The feedback on this is important in order to determine the factors that make them use the street and at the same to justify different factors to cater for different activities. The result from the survey also shows that the male group of users stressed the presence of activities on the street are one of the main factors that need to improve in JTAR in order to make a user-friendly street.

In order to identify the reasons for using the street in JTAR, the respondents were asked questions regarding the street that they normally used and the reasons they used the streets in Kuala Lumpur in general. In this research, the respondents were also asked about the streets that they most visited in Kuala Lumpur city centre and the main reasons why they used those streets. This was to get the overall trend of the reasons they used the street. Based on the feedback from the survey on the streets that they usually used in Kuala Lumpur city centre, the streets most mentioned included JTAR, Jalan Bukit Bintang, Jalan Masjid India, Jalan Ampang, Jalan Hang Tuah,Jalan Imbi, Jalan Duta and Jalan Pudu. This proved that Jalan Tunku Abdul Rahman was one of the most significant and popular streets used in Kuala Lumpur city centre. This shows that JTAR was one of the

most popular and significant to Kuala Lumpur residents. The feedback from this survey indicated that the most popular reasons they used the streets in Kuala Lumpur were for working, live there, shopping, its proximity, leisure and using the public transport services in that street. The results show that the majority of the users used the street for necessary purposes like working, live there and using public transport (transit area) (refer figure 6.11).

Based on the questionnaire survey of the occasional users (refer table 6.6), the most frequent reason they use JTAR is for shopping (30.1 %). This can be associated with JTAR as a shopping street and shopping was the main attraction in the city centre. Based on observations on the site even though there are different types of development, the most vital generators are business and commercial activities. In observation, it was also found that JTAR is associated with Indian Muslims, Indians and the Malay community due to the nature of trading activities that are actively participated in by the two ethnic groups. This is supported by the feedback from the interviews and from the statement by (Shamsuddin et al., 2010) in their study on JTAR in which the majority of users use the street for shopping purposes.

Reasons	Frequency (N= 161)	Percentage (%)
Shopping	48	30.1%
Working	12	7.5%
Visiting	18	11.4%
Meeting friends	32	20.0%
Relaxing	10	6.5 %
Studying	9	5.3 %
Entertaining	14	8.6%
Live there	17	10.3 %

Table 6.6: The most frequent reasons they used the street by users in JTAR
Source: Field study (2009)

The results from the observations survey on the activities in JTAR (figure 6.12) found that nodes of activities were more focused around shopping areas. The most popular nodes were the UO Superstore area, Mydin area, Maju Junction area, Sogo area, Gulati's area and Kamdar area (refer figure 6.3) which were shopping complexes and areas selling textiles. This supported that the main activity here was shopping. It was found that during observation, shopping activities were more during weekends and the intensity of people was very high around the UO superstore area and the Sogo area spreading to Pertama

Complex (figure 6.12). Responses from the interviews indicate that a variety of choices, diversity of products and distinctive products that they can get from this street make them love to shop here. This was proven by the comment from respondent no. 1:
"JTAR is special, shops are near to each other and there is a variety of choice in one place. If you want to buy things like bags, books, Malay costumes, 'kopiah' first thing in mind go to JTAR". (Respondent 1: Occasional user)

The second significant purpose for being in JTAR according to the respondents was meeting friends (20.0%) (Table 6.6). Meeting friends and enjoying food were also mentioned by the respondents in the interviews.
"There are restaurants that sell very interesting food along this street such as 'Nasi Padang' and Indian food." (Respondent 4: Occasional user)

Based on the observation on site, people met friends together enjoying food in restaurants or shopping together. The presence of outdoor cafes and restaurants that provide wireless Internet and air conditioning make the place suitable as a meeting place for people. Other activities such as visiting, relaxing and entertaining were optional activities that were present in JTAR. However, based on the survey the percentage of users for these activities were relatively low, this shows that this street is also not just used for necessary activities. Although 'hanging out' or leisure activities were not the main attraction in JTAR, the users still used the street during their free time. The results concerning the purpose for using the street in Kuala Lumpur also showed that they used the street for the purpose of 'hanging out' (Figure 6.11).

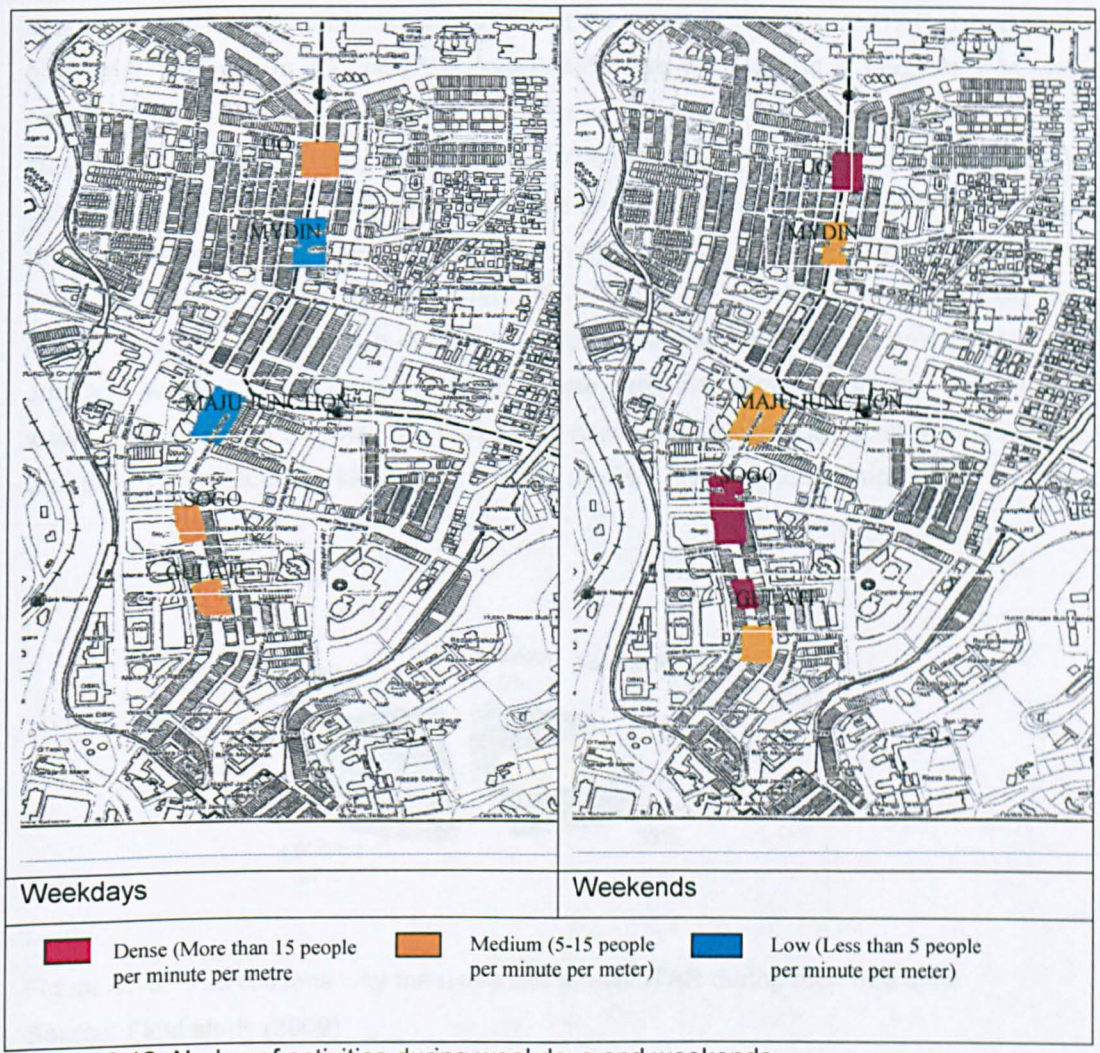


Figure 6.12: Nodes of activities during weekdays and weekends

Source: Survey (2009)

In this research, the respondents were asked their preferences for using JTAR during their free time. This was to identify whether or not the street is used for optional or social activities. The feedback from the occasional users shows that, 55.6 per cent like to come to JTAR during their free time (Table 6.7). This shows that the street is also a place for leisure activities. When talking about leisure it must be related to their optional and social activities in the street.

Like to use JTAR during free time		Total
Yes	No	
55.6%	44.4%	100 %

Table 6.7: Percentage of users that like to use JTAR during their free time

Source: Field survey (2009)

The occasional users were also asked about the reasons they used JTAR during their free time. The reason why only the occasional users were asked is because it is less relevant to ask daily users as they use the street no matter what. Hence, based on the survey of daily users they were mostly involved with necessary activities, which, according to Gehl (1991), were less sensitive to the surrounding environment compared to the occasional users. Most of them come here during their free time for leisure (33%), using the facilities (27%) and shopping (25%) (Figure 6.13). From site observation, the leisure related to dominant buildings such as Sogo, the Pertama Complex and Maju Junction, where it was observed that the people used the places for sitting, meeting and walking. However, in the case of JTAR it was found that most of the social activity appeal was passive contacts like seeing and hearing as Gehl (1991) said as 'superficial'.

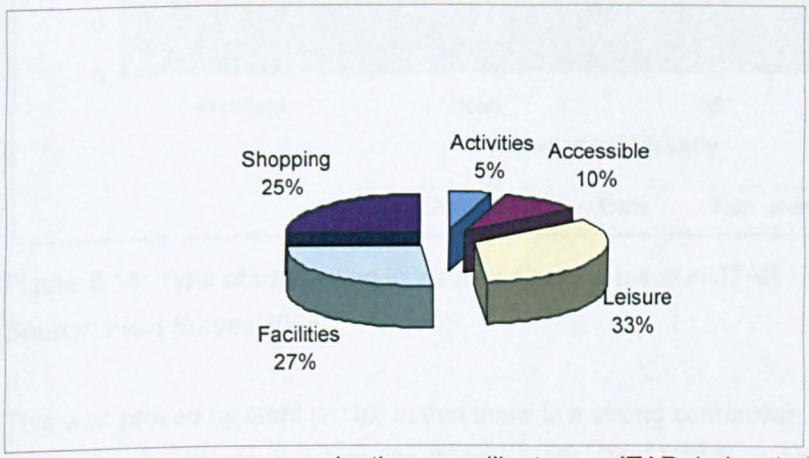


Figure 6.13: The reasons why the users like to use JTAR during their free time

Source: Field study (2009)

A pleasing environment is one of the sub factors that can attract activities onto the street and one of the criteria that support user-friendly factors. In this research, the respondents were asked about the actual environmental quality of the site. The results of the survey concerning the degree of visually pleasing places in JTAR (table 6.8) show that there was a moderately positive response from users' perceptions concerning the quality. There was a slight difference in users' perception between two types of user towards the street's "pleasing environmental quality".

		Mean Value (2.31)		
		Occasional	Daily	Non-user
1	Visually pleasing place Response format 1= Excellent 2= Good 3= Fair 4= Poor	2.36	2.11	2.46

Table 6.8: Degree of visually pleasing places in JTAR

From a comparison of the three types of user it was found that the daily group of the users gave a more positive response with a scale of 2.11, followed by the occasional user group (2.36) and non-user group (2.46). This shows that visually pleasing place is one of the factors that can attract people to use the street (figure 6.14).

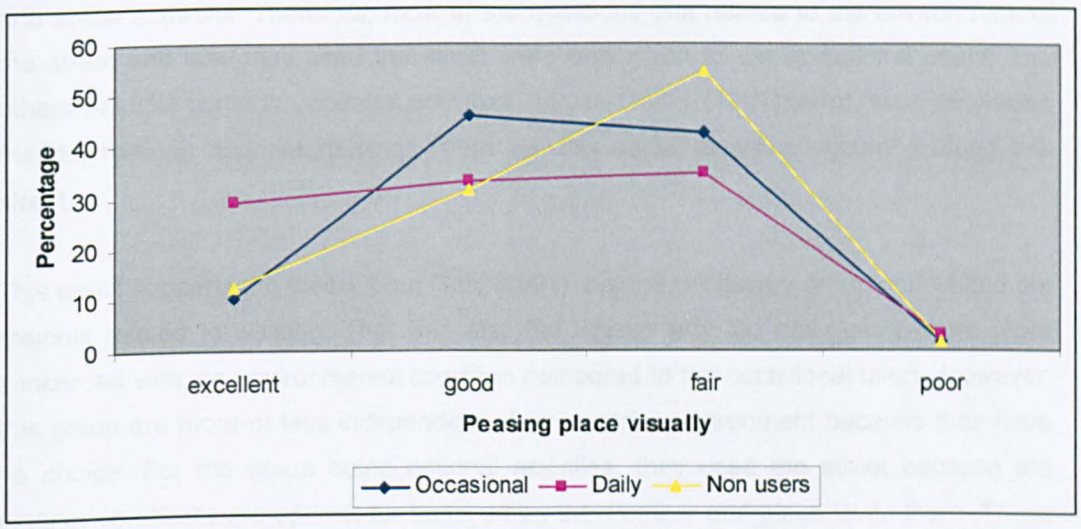


Figure 6.14: Type of user rating to visually pleasing place in JTAR

Source: Field Survey 2008

This was proved by Gehl (2010) in that there is a strong connection between the qualities of the physical environment on site (Figure 6.15). Gehl (2010), in his research, found that an increase in environmental quality will give a boost to optional activities and at the same time will increase the social activities.

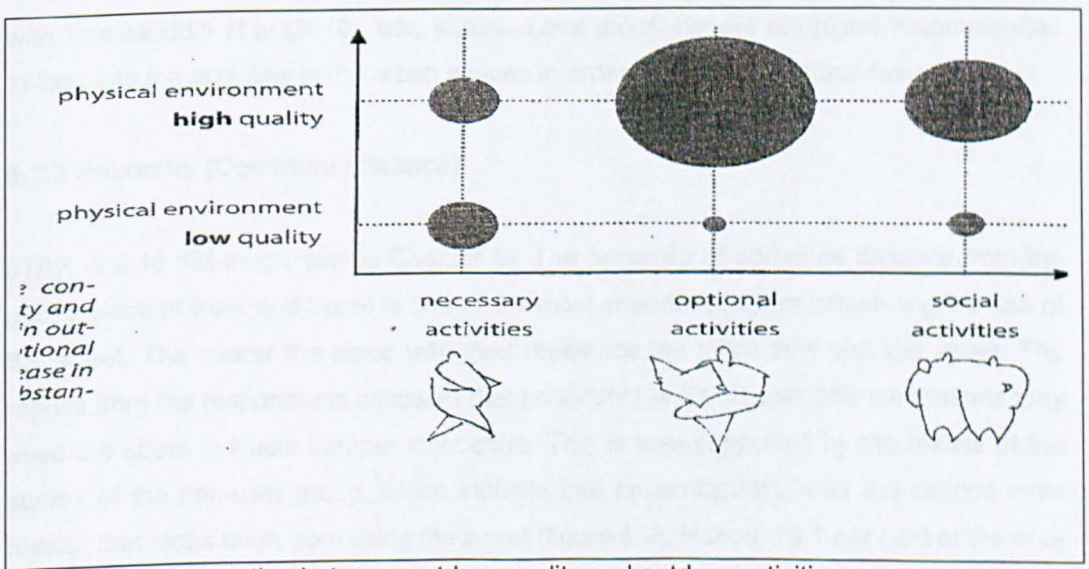


Figure 6.15: Connection between outdoor quality and outdoor activities

Source: Adopted from Gehl (2010) p.21

Based on the reasons they used the street we can say that most of the activities in JTAR were among the necessary activities (53.4%) such as shopping, working, living there and studying. Meaning that, the awareness concerning a friendly-street from the users under necessary activities was lower compared to the group that came to the street for optional and social activities. Therefore, most of the questions that related to the environment of the street and how they used the street were only given to the occasional users. The others (46.6%) come for 'optional activities' (to use Gehl's (1991) term), such as visiting friends, relaxing and entertaining. There are few social activities occurring along this street.

This result supports the theory from Gehl (1991) that the necessary group constituted the majority related to walking. That was also the reason why the daily group were more concerned with the environmental condition compared to the occasional users. However, this group are more or less independent of the exterior environment because they have no choice. For the group doing optional activities, they used the street because the exterior conditions are optimal for them, when the weather and place invite them. These activities are dependent on exterior physical conditions. Most of them use the street because they have to use it. This was reflected in most of the respondents' statements when they described shopping and meeting friends as the main reasons they use the street.

The understanding of the activities that occur in the street is important to generate new ideas and also for proposing new development that is friendly to their users. This is in line with Shamsuddin et al (2010), who stressed that the designers are highly recommended to look into the activities in the urban spaces in order to exploit for future design.

6.2.3 Proximity (Commute distance)

JTAR is 2.48 KM long (refer to Chapter 5). The proximity or commute distance from the user's place of work and home is one of the most important factors influencing the use of the street. The nearer the place with their residence the more they visit the street. The results from the respondents indicated that proximity (14.77 %) was one the reasons they used the street in Kuala Lumpur city centre. This is also supported by the results of the survey of the non-user group, which indicate that proximity(28%) was the second main reason that stops them from using the street (figure 6.9). Hence, 79.1 per cent of the non-users were the respondents who stayed outside of a 5 kilometre radius from JTAR.

In terms of using pattern, the only variables that show a significant difference is the distance from residence (table 6.9). Most of the respondents who stay more than 20 km distance visit this street occasionally. The respondents who stay within 10 km radius with JTAR are the group that most frequently visit JTAR. This result shows that instead of necessary activities that make them use the street, the commuting distance or proximity was another major contributor factor.

Variables	Test	Result
Visit JTAR	Chi-square	χ^2=20.163, df=8, p= 0.008
Frequency of visit		χ^2= 33.105, df=16, p= 0.007
When come to JTAR		χ^2= 20.311, df=8, p= 0.022
The main attraction		χ^2= 38.640, df=24, p= 0.030

Table 6.9: Chi-square test on using pattern according to distance from residence

Distance from residence does affect the respondents' frequency of a visit to JTAR. Result from survey shows that the shorter the distance the often they used the street (Figure 6.16). Figure 6.16 show that 46.7 per cent of the respondents who stay 1-5 kilometre and 31.7 per cent of the respondents who stay between 5-10 kilometres from JTAR used the street daily.

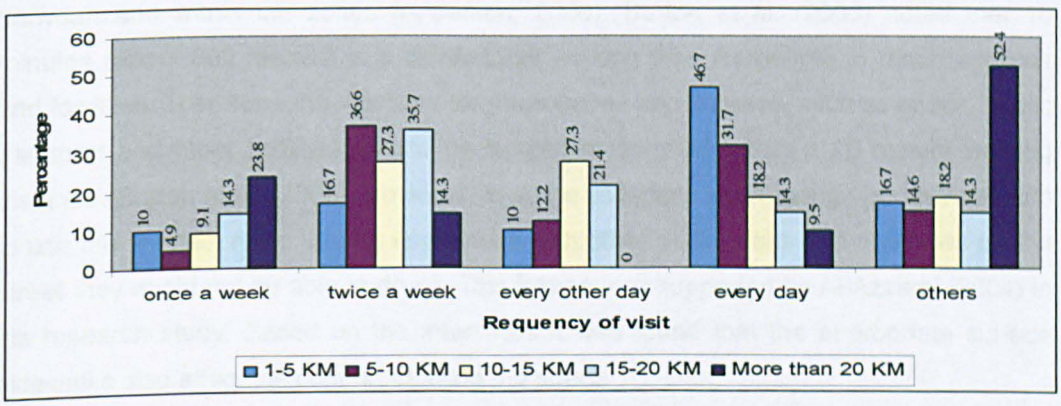


Figure 6.16: Relationship between respondents' frequency of visit with the distance to JTAR

Source: Field survey (2009)

People are much more likely to walk to a given destination if they perceive that the distance is not too far. The perceived distance can be influenced by the right type of land use and design characteristics. Based on observations it was found that design element such as continuous walking systems that connect door fronts with transit stops or other destinations can create good connections. Results from the interview show that most of

the respondents mentioned that they managed to walk from Maju Junction shopping complex to the end of the street towards Dataran Merdeka or towards the Chow Kit area which around 1.2 kilometres length. Only few of the respondents walked the whole length of the street. This supports the statement from most of the authors in the literature review that people choose to walk approximately 1 kilometre.

JTAR also functions as a main connecting street to other parts of the city centre and is very accessible as a local street connector. This street is also linked by the LRT stations (Masjid Jamek and Bandaraya) and is also closely linked to the Seremban- Rawang commuter station. The proximity of public transport and shopping spots make this street highly accessible for pedestrians. The proximity of one spot to another is a positive response factor that encourages people to use the street as per the comments expressed by respondent no.9:

"as a pedestrian, this street is very comfortable to use because there's a connection from one spot to another, the street is also walkable to pedestrians to walk because the walking distance from one spot to another is still fine' (Respondent no.9: Female)

The presence in proximity in JTAR contributes to accessible street that gives pedestrians comfort of the street (Carney, 2000). This aspect will help the street users to move between and within the zones (Anderson, 2006). Burton et al. (2006) noted that 10 minutes (about 800 metres) is a comfortable walking time for people to reach services and facilities. Therefore, the locations for the services and facilities, such as shops, public transport and other facilities should be located or situated within a 10 minute walking distance (Burton et al., 2006). However, in some situations even though pedestrians aim to use the shortest route, due to encounters with other pedestrians and obstacles on the street they might not be able to do so. This finding was supported by Al-Azzami (2004) in his research study. Based on the interviews it was found that the appropriate surface sidewalks also affect the comfort of using the street.

People are much more likely to walk to a given destination if the walking distances are not too long. Proximity from the parking area to the users' destination is another key factor that contributes to the feeling of comfort to the street users. Even though, based on the users perception scale concerning the importance of free physical barrier attributes is lower than the others attributes mention above. This criterion is also important to discuss because of the users' comment in the interviews and also based on observations on site.

6.2.4 Congestion

The street environment plays an important role that makes people use the street. Congestion in this research can be divided into traffic congestion and pedestrian congestion, which contribute to the reasons why they avoid using JTAR. It was proven by the result from questionnaires survey that indicates that congestion as one of the factors why the users do not use the street (Figure 6.9). This is also supported by the results from the occasional users in that one of the main reasons they did not like to come to JTAR during their free time is because the street was too congested (39%) (Figure 6.17).

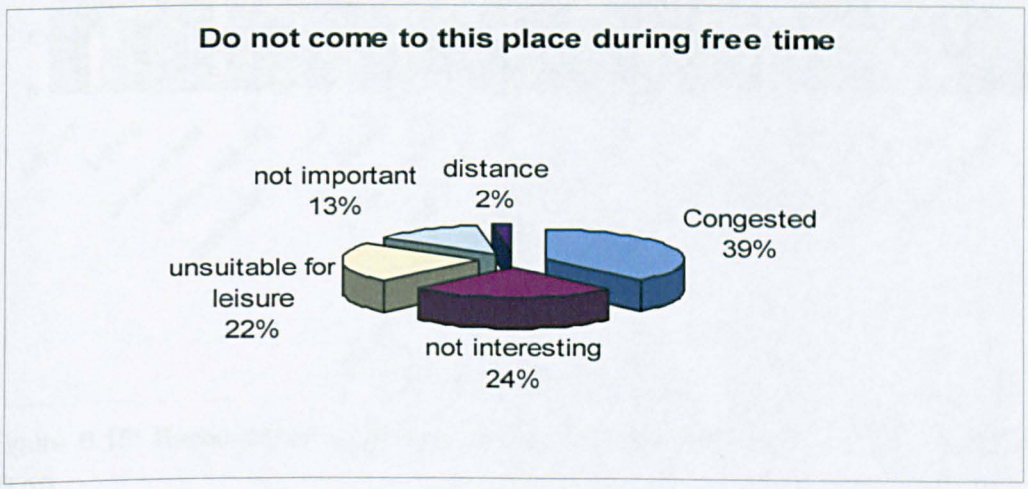


Figure 6.17: Reasons not using the street during free time
Source: Field survey (2009)

Pedestrian congestion

Pedestrian congestion is one of the main reason people avoid using JTAR. This is supported by the findings from the observations along JTAR especially in the Chow Kit area where the environment was congested with people, beggars and lots of migrants (Figure 6.20). The users also stressed the need to reduce congestion in JTAR. Based on the survey concerning improvements needed to JTAR, all types of user suggested reducing congestion on the street as the highest priority (Figure 6.18). Of the three types of user, the daily group users suggested that reducing congestion was the main improvement to JTAR followed by the non-user group of users.

In JTAR, the feeling of crowding was also caused by the speed of the pedestrians. People who walk along this street tend to walk much slower for the purpose of shopping.

This is supported by the findings from Al-Azzami (2004) in his research, which looked at the movement of pedestrians in shopping streets. He found that pedestrians walked much slower when shopping than for other trip purposes. This was because the shoppers tend to stroll, stop to look in windows, travel with children and carry luggage (Al-Azzami, 2004).

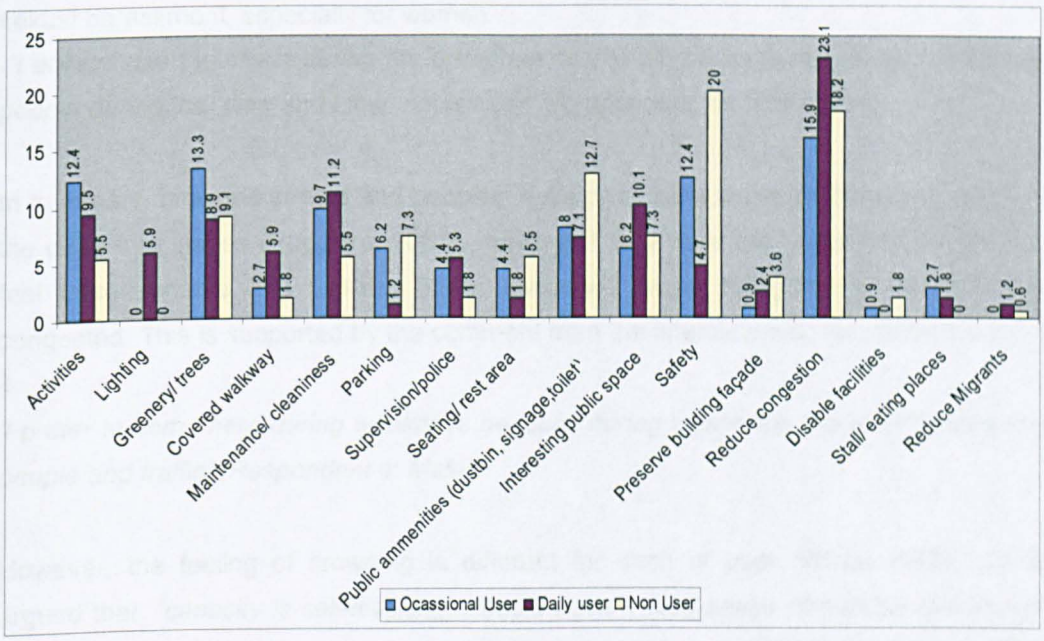


Figure 6.18: Respondents suggestions concerning the most needed improvements in JTAR

Figure 6.19: Pedestrian environment in JTAR
Source: Field Survey (2009)

People congestion makes people feel uncomfortable and unsafe to use the street which contributes to the feeling of stress (Krupart, 1985). This is proven by the respond from

many respondents in the interview who mentioned that the people congestion contributes to the feeling of being uncomfortable and unsafe. Some of the respondents in the interview stated that the presence of people can increase their feeling of safety in using the street (Respondent no:11); however, if there are too many people it will became an unsafe environment due to the possibility of crime such as pick pockets, beggars and sexual harassment, especially for women.

"I always use the street during the afternoon or late afternoon because there are many people during that time and I feel much safer" (Respondent no 11: Female)

In summary, crowded streets and peoples' eyes produce a sense of belonging and turn the cities into stages (Ruggiero, 2001); however if they were too congested people may feel uncomfortable and unsafe. Street users will avoid using streets that are too congested. This is supported by the comment from the interview with respondent number 4:

'I prefer to come here during weekdays because during weekends it is too crowded with people and traffic' (Respondent 4: Male)

However, the feeling of crowding is different for each of user. Whyte (1988, p.172) argued that, *"capacity is self-levelling. People have a nice sense of number that is right for a place, and it is they who determine how many is too many"*. If we look and compare the street with other commercial streets in other countries like Indonesia, China and India, the street does not look too congested and not overcrowded. This may be relating with the culture of Malaysian street users who are very sensitive on the busy environment.

Traffic congestion

Based on observations on site, the street was not only crowded with pedestrians but was also dominated by motorists on the road, especially in the Chow Kit area where there is a four lane road (figure 6.20 and figure 6.21). The high use of private cars also contributed to congestion in JTAR. Based on the users mode of transportation to this place, it shows that most of them use a private car (39.3%), LRT (36.8%), followed by motorcycle (14.5%), bus 7.7% and taxi 1.7% (Table 6.10).

Figure 6.20: Street environment in JTAR

Figure 6.21: Street environment in Chow Kit area

Transport	Frequency	Percentage (%)
Car	46	39.3
Bus	9	7.7
Taxi	2	1.7
LRT	43	36.8
Motorcycle	17	14.5
Total	N= 117	100

Table 6.10: Transportation to JTAR for occasional users

Source: Field work (2009)

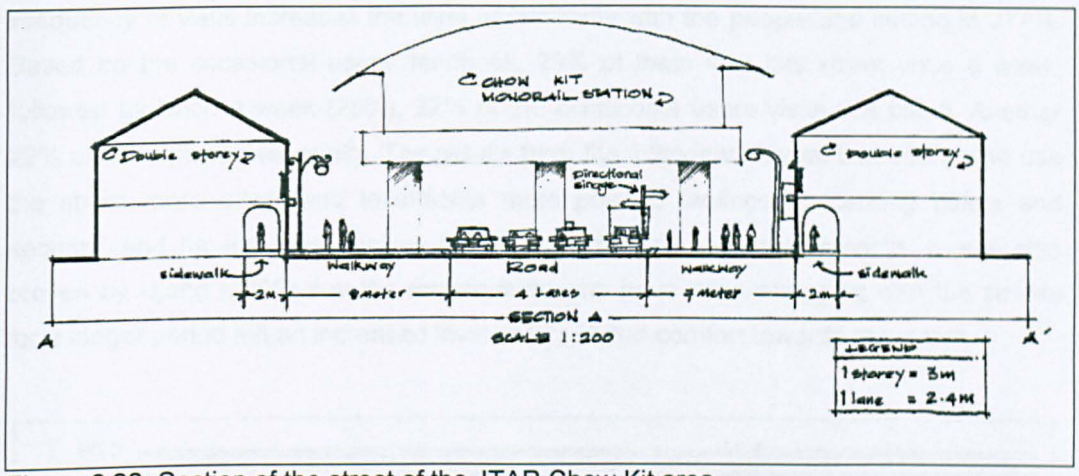


Figure 6.22: Section of the street of the JTAR Chow Kit area

Source: Field observation (2008)

In some places along the street, it was also found based on observation that the improper of motorcycle parking create congestion. The motorbikes that park illegally on the sidewalk cause clutter and make the pedestrian space more congested.

6.2.5 Familiarity and length of engagement

The more familiar people are with a place the safer they feel with the environment. According to Ujang (2008), familiarity with shopping streets closely reflects the user's ability to identify locations and elements associated with it. Based on the feedback from the respondents who did not use (non-user) JTAR, one of the significant reasons they do not use the street was because they were unfamiliar with the street (Refer to figure 6.9).Familiarity is related to their length of stay and how long they are involved with the street. Users who are more familiar with the street feel safer to use the street alone compared to the group of users that not familiar with the street studied. The results from the daily users show that the majority of users who engaged with JTAR for more than five years feel safe to use the street alone (refer to figure 6.23). Most of the respondents (35.9 %) that said 'yes' to use the street alone in JTAR were the group of users who had been engaged with JTAR for more than 15 years. This is supported by the comment by respondent no 1;

*"As a man I feel safe to walk in this street alone, in addition, I'm quite familiar with the place (JTAR), which increases my confidence to use the street alone". (*Respondent 1: Male*)*

Frequency of visits increases the level of familiarity with the people and setting in JTAR. Based on the occasional users' feedback, 29% of them visit this street once a week, followed by twice a week (26%), 22% of the occasional users visits this place. Another 22% use the place seasonally. The results from the interviews reveal that users who use the street more often tend to indicate more positive feelings concerning safety and security, and have a less positive feeling for satisfying the environments. It was also proved by Ujang (2008) that the respondents who have been engaging with the streets for a longer period felt an increased level safety of and comfort towards the street.

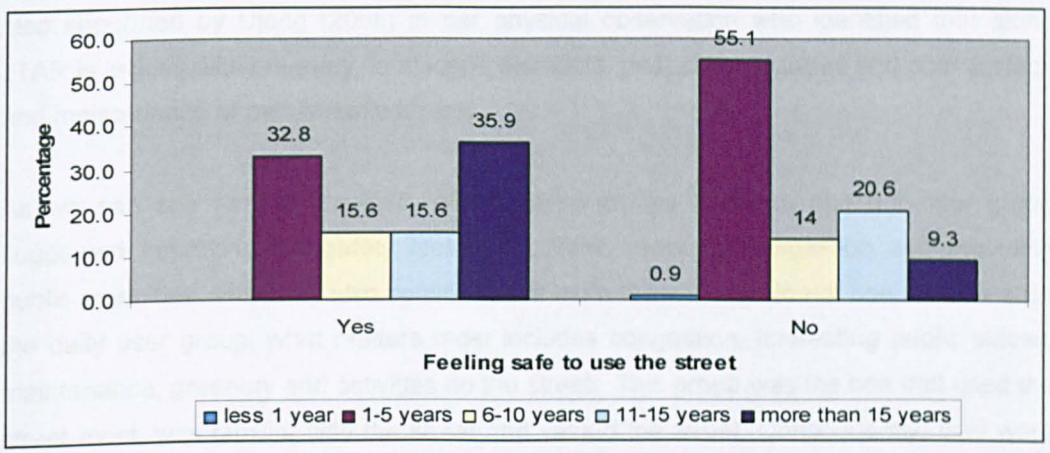


Figure 6.23: The relationship between length of engagement with JTAR and their feeling of safety

Source: Field survey (2009)

This shows that familiarity and frequent engagement with the street make the street friendlier to users by developing a greater sense of belonging and strong emotional feelings about the place. This was reflected by the comment of Respondent no.6:

"As a Kuala Lumpur citizen I'm already used to the environment and do not feel unsafe while using the street. For me, here is where everything started. Honestly when walking alone JTAR I feel like this is our hometown and feel a sense of belonging".

This statement is in line with the findings of Ujang (2008), who found that familiarity contributed to a stronger sense of belonging and evokes emotional and social attachment.

6.2.6 Other supportive factors

In addition to the factors mentioned above, there are other factors that are important to users that make them use the street. Although it was not relatively high in the survey, it

was it were mentioned by many of the respondents in the interviews and also supported by the observations done on site. Hence, Figure 6.18 shows that based on users' suggestions concerning the improvements needed in JTAR, the public facilities, such as interesting public spaces, improvement to public facilities (toilets, signage and dustbins), seating, greenery and trees, parking, maintenance and activities. Based on the interviews, the majority of them mentioned that pedestrian facilities were the main factors to make them use the street. Sufficient and proper parking, ample seating/rest area, greenery/shade for pedestrians, suitable material used for pedestrian walkways and good maintenance were the factors that users need in respect of the street. The findings are also supported by Ujang (2008) in her physical observation who identified that along JTAR is lacking with greenery, landscape elements, pedestrian facilities and poor surface and maintenance of pedestrian walkway.

As we can see from figure 6.18, of the three groups of users, the non-user group suggested improving the safety factors in JTAR, reducing congestion and providing public amenities. This may also constitute the main reason why do not use JTAR. As for the daily user group, what matters most includes congestion, interesting public places, maintenance, greenery and activities on the street. This group was the one that used the street most, was familiar with the street and valued the street. Consequently, they were more concerned with improvement of the environmental condition making it more pleasant and comfortable - rather than the safety factor.

a) Public Space

It was identified in figure 6.18 that public space is one of the elements in JTAR that needs improvement. The results from the survey indicate that the respondents need interesting public spaces (figure 6.18). In the interviews, most of the respondents mentioned creating more spots for people to rest and seating such as small pockets of space. This was reflected by the comments of respondent no.2:

' as a pedestrian, at a certain distance we need to take a rest, I think we need to provide some pockets of space along the street like Bukit Bintang Street (one of the shopping streets in Kuala Lumpur) where we can stop and have a break and continue walking to another destination'(Respondent no 2: Female).

Of the three groups of user, the results of the survey show that the daily group of users mentioned the need for improvement of the public spaces along JTAR the most. This is because this group comprises the users that spend more time in JTAR, and, therefore, need a space that interests them for leisure purposes. As for non-users, the lack of

interesting public spaces in JTAR may be one of the reasons why they were not using the street. JTAR has a rich public realm in which the shops, offices and restaurants offer leisure facilities to the public. As for gender groups of user, the male groups of users indicated the need for improvement of the public spaces along JTAR more compared to female group of users (figure 6.24). These according to the observation due to the majority of users who spend more time in outdoor spaces and involved more in outdoor activities are male group of users. This finding concur with Loukaito Sideris (1995) and Sisiopiku et al (2003) who found that female are the minority group that use urban space.

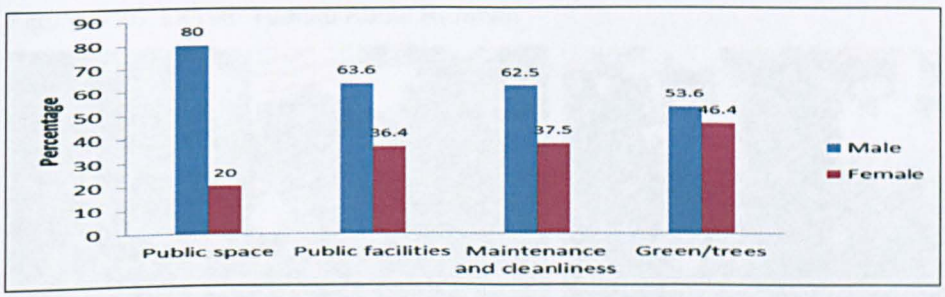


Figure 6.24: Factors that make the users use the street by gender

JTAR is a linear urban commercial street, and apart from the street itself the only formal public space here is 'Laman Tuanku Abdul Rahman' (figure 6.25). It was observed that this space was not truly used by users especially women. Based on the observations, this place was only used by people during festivals when they built temporary kiosks to sell things and every Saturday night when there is a night market nearby. From observation, it was identified that Laman Tuanku Abdul Rahman is sunken from it surrounding, which gives a feeling of insecurity when using this space due to the lack of pedestrian surveillance. Whyte (1980) argued that locating spaces away from the street level, like sunken spaces or roof top urban space is not convincing in terms of safety. Hence, the presence of undesirable people, such as beggars and the homeless, the hedges that block the view from the street, and bird droppings everywhere contribute to the feeling of discomfort to the users. As Whyte (1980) noted, public users are not only frightened by criminal acts in urban spaces but also by 'undesirables'.

Figure 6.25: Laman Tuanku Abdul Rahman

Figure 6.26: Open space in front of SOGO shopping complex

It was proven from observation that the presence of people and activities in a space can attract other people to use the space. This was proven by the observation of the SOGO area. Unlike Laman TAR, the small square in front of the SOGO shopping complex contributes a vibrant public space with musicians, salesman, hawkers selling food and drinks and individuals handing out brochures and flyers (Figure 6. 26).

b) **Greenery/ trees**

As shown in Figure 6.18, greenery is one of the criteria that need to be improved in JTAR. Between the three groups, the occasional group was the group that most stated that the greenery aspect had to improve in JTAR. The details discussion on how the trees and greenery along the street do affect the uses of the street will discuss in chapter 7.1.2 (c).

c) Public amenities

A public amenity is another factor that needs to be taken into account in creating a user-friendly street. According to figure 6.18, this is one of the factors that are lacking and

needs improvement in JTAR. Lack of public amenities is one of the main reasons people do not use the street. This is supported by the results of the survey, which shows that the non-user group constituted the highest percentage that indicated the need for improvement of the public amenities in JTAR. This factor is also revealed as one of the attributes that contribute to a user-friendly street. Facilities on the street such as dustbins, telephones and toilets are among the attributes perceived by respondents as being the most important to create a convenient street and at the same time contributing to a friendly Street. The results show that the daily group especially male group and elderly group of users expressed the importance of availability of these elements the most. This means that people who spend longer on streets will use these elements more. As for the elderly group, availability of public amenities is important for their ease of activity and amenity (Forsyth, 2003; Turel, 2007).

JTAR has a number of street furniture and pedestrian facilities provided for the pedestrians as well as a police booth. Based on the observation, signage and cues are also provided along JTAR. However, all these elements should be more in number and more legible to the pedestrians that walk along the street. JTAR has seating, ledges and stairs for pedestrians to sit or rest, however, the amount of seating is still lacking. Public toilets are also provided along this street (Figure 6.27).

Figure 6.27: Public facilities provided in JTAR
Source: Field observation (2009).

However, based on the interviews it was found that the public toilets were inadequate and needed improvement in terms of maintenance and cleanliness. Many of the users expressed a preference for using the toilets provided inside the shopping complexes rather than public toilets provided outdoors. This was reflected by the comments of respondent no. 13:

"I prefer to use the toilet provided inside the shopping complex because it is cleaner and more comfortable" (Female)

The presence of all these public facilities gives the feeling of convenience to the street users in JTAR. However, the numbers, qualities, maintenance and location of the facilities should also take into consideration. Based on observation in some areas along the street, to the location of such facilities is not appropriate causing a blockage and creating clutter for pedestrian movement. Hence, some of the facilities provided along the street are not sufficient (e.g. dustbin and telephone booth), not function (e.g. telephone booth) and not well maintain (e.g. public toilets) that gives inconvenience to the street users. The maintenance issue will be discussing in the sub-section as one of the supportive factors that make people use the street.

d) Maintenance and cleanliness

Good maintenance and cleanliness of the street was another factor that users need most on the street. The results from the survey show that the majority of the users rated the cleanliness and maintenance of JTAR as fair. The results of the survey for the degree of cleanliness and maintenance of JTAR show that there was a slightly positive response concerning the quality (Table 6.11). From a comparison of the three types of user, it was found that the daily group of users gave a more positive response with a scale of (2.17), followed by the occasional user group (2.35) and non-user group (2.82). This shows that maintenance and cleanliness are one of the significant factors that contribute to a friendly street. This is supported by the results of the survey concerning the suggestions for improvements needed to JTAR as this factor became one of the significant factors needed to improve JTAR (Figure 6.18).

		Mean Value		
		Occasional	Daily	Non-user
1	Cleanliness of the street	2.44	2.14	2.58
2	Maintenance of the street	2.26	2.19	2.44
	Mean value Response format 1= Excellent 2= Good 3= Fair 4= Poor	2.35	2.17	2.82

Table 6.11: Degree of cleanliness and maintenance in JTAR

Source: Field survey (2009)

Based on the observation on the site studied, it was proven that there were some areas along JTAR that were not well maintained and were poor in terms of cleanliness (Figure 6.28). This not only gives a bad impression and bad views to the street users but also creates the feeling of a lack of safety and discomfort to the street users. The feedback from one tourist (Korean) to our streets is that in some areas, the pedestrian walkways are not well maintained, which make it unfriendly to the users (Chan, 2011). This is also supported by the feedback from the users' perceptions of streets in the UK. It was found that the streets most chosen by users in the UK are streets that are clean and well maintained (Carmona et al., 2008)

Figure 6.28: Lack of maintenance of pedestrian walkway in JTAR
Source: Field observation (2009).

e) Freedom of action

The results from the survey (table 6.12) indicate that the majority of the users agreed that JTAR provides an opportunity to interact with each other. Most of the respondents from the occasional and daily groups feel that JTAR is a street that provides an opportunity for them to interact with each other. However, for non-users 45.6% of them answered differently (Figure 6.29). This may be because they do not use JTAR. This is supported by Rivlin (1994) in that freedom of action in public space is one of the important factors that contribute to a good space. Freedom of action is related to spatial rights, as, according to Lynch (1981), it is related to behaving freely in a place.

Provides an opportunity to interact with each other	Frequency	Percentage (%)
Yes	270	78.3
No	75	21.7
Total	N= 345	100

Table 6.12: Opportunity to interact with each other
Source: Field survey (2009)

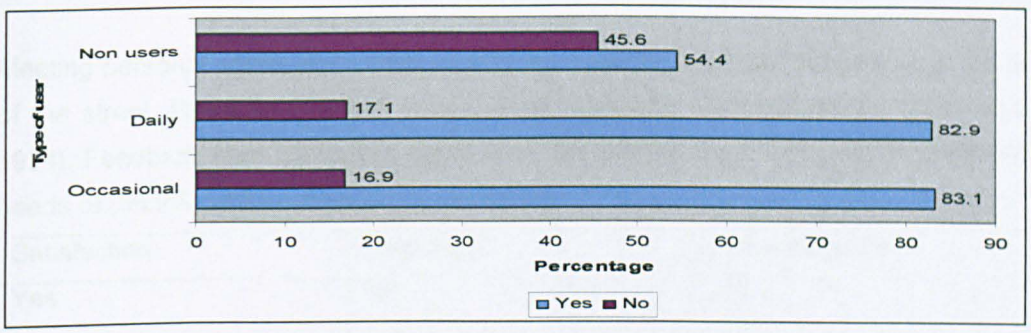


Figure 6.29: Opportunity to interact with each other in JTAR

Source: Field survey (2009)

The feeling of self-belonging with the street increases the social interaction in the public space. The level of caring for each other contributes to the use of the street. The respondents were asked about their perception concerning the place, and whether the people care about each other in JTAR. It was revealed that (Table 6.13) the daily group give very positive rate compared to the occasional and non-user group, which shows that the daily users were much more familiar with the street and the attachment level was higher, giving more of a 'sense of belonging' towards the place.

		Mean Value		
		Occasional	Daily	Non-user
1	People care about each other Response format 1= Excellent 2= Good 3= Fair 4= Poor	2.30	2.17	2.49

Table 6.13: Degree of 'caring about each other' in JTAR

Source: Field survey (2009)

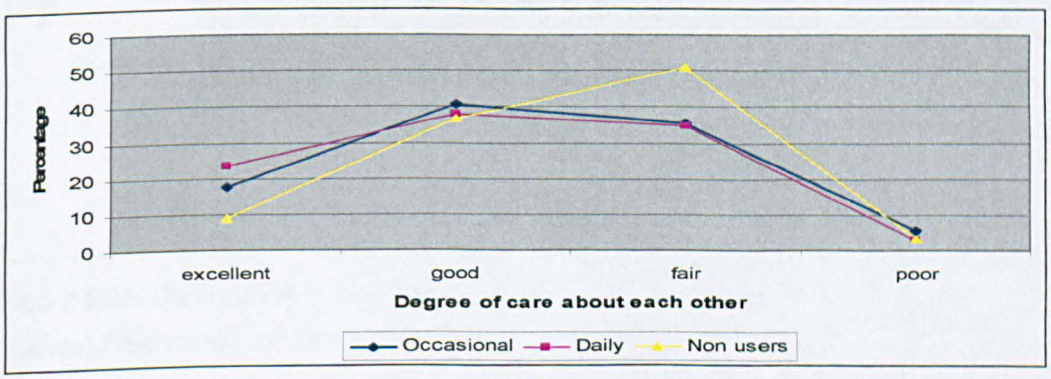


Figure 6.30: Degree of 'caring about each other' in JTAR

Source: Field survey (2009)

Meeting personal needs also contributes to the freedom of action that relates to the use of the street. Freedom of action is also about satisfying personal needs (Carrs et al., 1994). Feedback from the survey (table 6.14) shows that the street (JTAR) satisfies the needs of (56.9%) while not satisfying the others.

Satisfaction	Frequency	Percentage (%)
Yes	197	57.1
No	148	42.9
Total	345	100.0

Table 6.14: Satisfy personal needs

Source: Field survey (2009)

Different types of user have different needs. The results of satisfaction on users personal needs show that occasional groups gave the highest percentage (69.7%), which said yes followed by daily user in which 56.8 % of them said yes. Unfortunately, the majority (68.4%) of the non-users answered that JTAR did not satisfy their personal needs (figure 6.30). In respect of this feedback, we can say that personal needs are important to make the users use or not use the street. This is supported by Shamsuddin (2007) who stated that user-friendly is related to the functional balance between human needs and environmental factors. In addition, meeting the users' actual needs is important to evaluate the quality of the street that is friendly to them (Jansson, 2010).

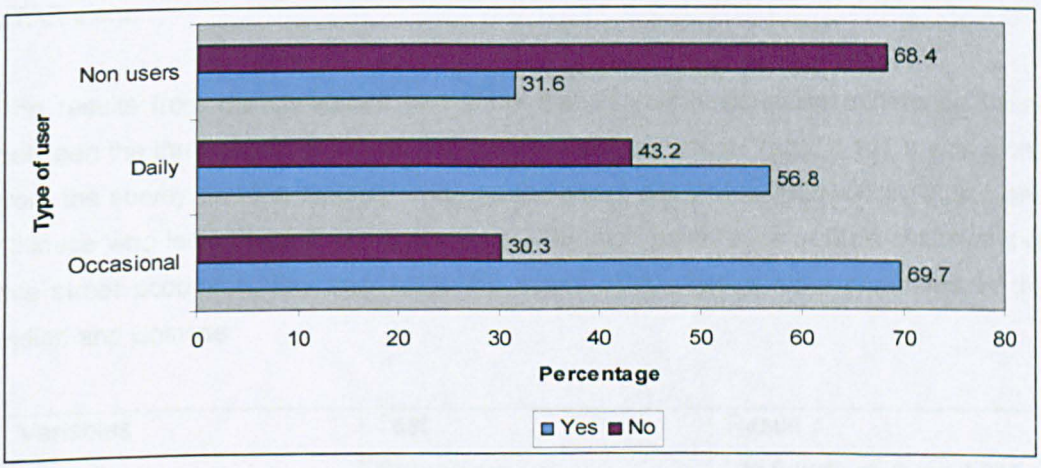


Figure 6.31: Satisfy personal needs

Source: Field survey (2009)

6.3 Variations between different socio-demographic backgrounds concerning how they use the street.

In this section, discusses the variations between different socio-demographic backgrounds concerning how they use the street. In order to achieve this, cross tabulation and the chi-square test are used. The frequencies of all variables and Chi-square (χ^2) test are used to assess the validity and significance of the variable's relationships in a contingency table. The relationship is only assumed to be statistically significant if the probability level is 0.05 or less. A significant relationship only shows the degree of association not what the association is, whereas the result of the chi-square test (χ^2) shows the degree of association between two variables.

It was found that only three groups show variations in how they use the street. The groups that show variation are ethnicity group, age group and gender group.

a) Ethnicity

Based on the survey, there are similar patterns between the three groups -Malays, Chinese and Indian in the way they use the street. The three groups use the street mostly every day and twice a week. Most of them spend about 1-4 hours and 5-8 hours and they use the street in the morning and late afternoon. The same pattern is also shown for their means of transport in getting to JTAR in that the majority use private cars and the LRT. They also normally come to JTAR with their peers and do not feel safe to walk along JTAR alone.

The results from the chi-square test show that very little significant difference exists between the three ethnic groups in the way they use the street (Table 6.15). It was found from the survey that the majority who use the street are Malay, followed by Indian and Chinese who least used JTAR (figure 6.32). The high percentage of Malays shows that this street accommodates and, fulfils the needs of this group more compared to the Indian and Chinese.

Variables	Test	Result
Ethnicity	Chi-square	χ^2= 8.386, df=2, p= 0.015

Table 6.15: Chi-square test on the use of JTAR

Source: Field Survey 2008

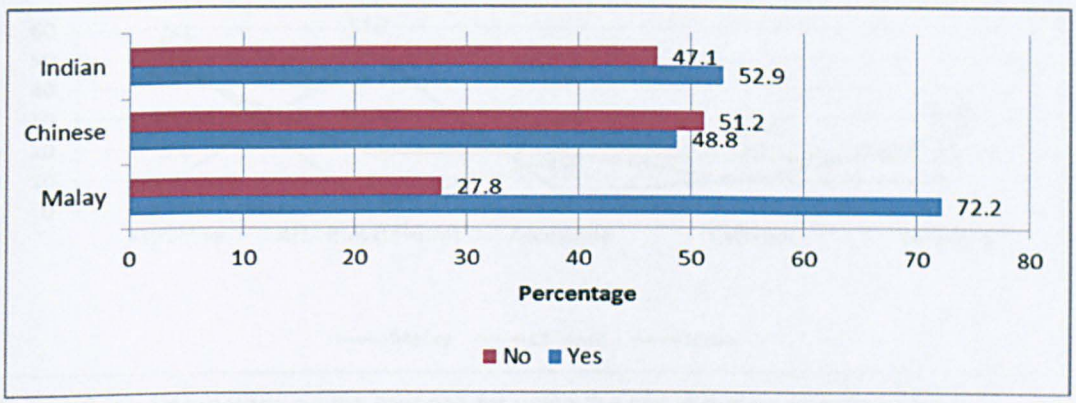


Figure 6.32: Percentage between ethnicity on the use of JTAR

Source: Field Survey 2008

Another criterion that shows a significant difference between the ethnic groups is the reasons they come to JTAR during their free time (Table 6.16). Figure 7.24 shows that the reason they come to JTAR during their free time varies. The Malay group comes to JTAR in their free time for leisure activity (51.7 per cent) followed by shopping (23.9 per cent). The reasons why Malay group is the main group who used the street for leisure activities and shopping are because of the presence of users with a majority of Malays in JTAR and also most of shops and goods activities along this street caters such as textile products such as scarves and traditional costumes, jewellery, foods and restaurants are mainly catered the needs for this group (page 146 Chapter 5). This is related with attachment factors that influence the reasons they used the street. The finding is supported by Ujang (2008) in her research who found that most of the Chinese are more attached with Jalan Petaling meanwhile for Indian group they are more attached with Jalan Masjid India the activities and facilities provided in that street suit them.

Variables	Test	Result
Ethnicity	Chi-square	χ^2= 32.633, df=18, p= 0.018

Table 6.16: Chi-square test on the reasons for using the street during their free time

Source: Field Survey 2008

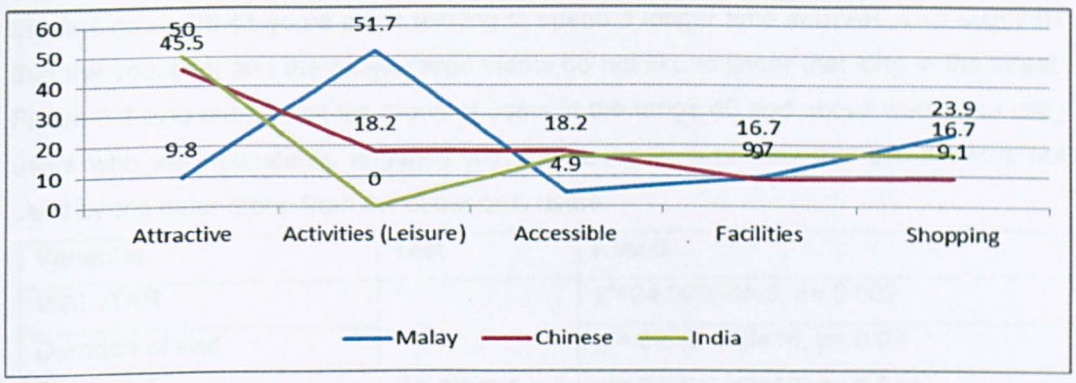


Figure 6.33: Percentage on the reasons for using the street during their free time
Source: Field Survey 2008

In summary, in terms of variations between ethnic groups towards how they use the street, there are no significant differences. The only variations shown in the survey are their use of JTAR and their reasons for using JTAR during their free time. From here we can say that there is no variation in the pattern of use between the ethnic groups. The findings are in line with the previous research concerning the qualities of urban place in Malaysia city centres by Shamsuddin (1997) and Ujang (2008). This is also supported by Whyte (1980) in his research, which he found that regardless of cultural differences the pattern in which they used the park was much the same. Even though they are different according to cultural and social groups and tend to have different traditions, costumes and habits they are very similar in the way they use the street.

b) Age group

Age group shows variations in their use of the street (table 6.16). This is supported by Forsyth (2003), who noted that age group is an important dimension in terms of different uses of urban space. The results of the Chi-square (χ^2) test show that there is a significant difference between the age group with the duration of time spent in JTAR. The duration of visit according to the 'age group' factor shows a significant difference with the result χ^2= 29.594, df= 16 and p= 0.02 (Table 6.17). The respondents' feedback from different age groups varies significantly in the duration of time using JTAR. There is no respondent in the age group under 18 uses this street for more than 5 hours. The majority of the respondent's aged between 18- 24 spend about 1-4 hours in this street. Most of the street user in the age group 18-45. Most of the street user in the age group 18- 45 years old spend between 1 and 4 hour to 5 and 8 hours there (figure 6.34). However the 26-45 age group tend to spend longer in that street. The graph shows that respondents in the age group 26-45 years old are varied most in the duration they spend in JTAR. The group aged above 60 years spends about 5-8 hours in that street. Those in

the age group 26-45 years old is tending to spend a longer time in JTAR. This suggests that the youngest and the oldest respondents do not like to linger that long in the street. Figure 6.2 also shows that the group of users in the range 46 and above were from daily users who were constantly engaged with the street. This reflects that this street is not used by the older group from the occasional users.

Variables	Test	Result
Visit JTAR	Chi-square	χ^2=24.099, df=8, p= 0.002
Duration of visit		χ^2= 29.594, df=16, p= 0.02
Come with whom		χ^2= 21.426, df=12, p= 0.044
Used JTAR on free time		χ^2= 74.138, df=36, p= 0.000

Table 6.17: Chi-square test on using pattern in JTAR according to age group

Source: Field Survey 2008

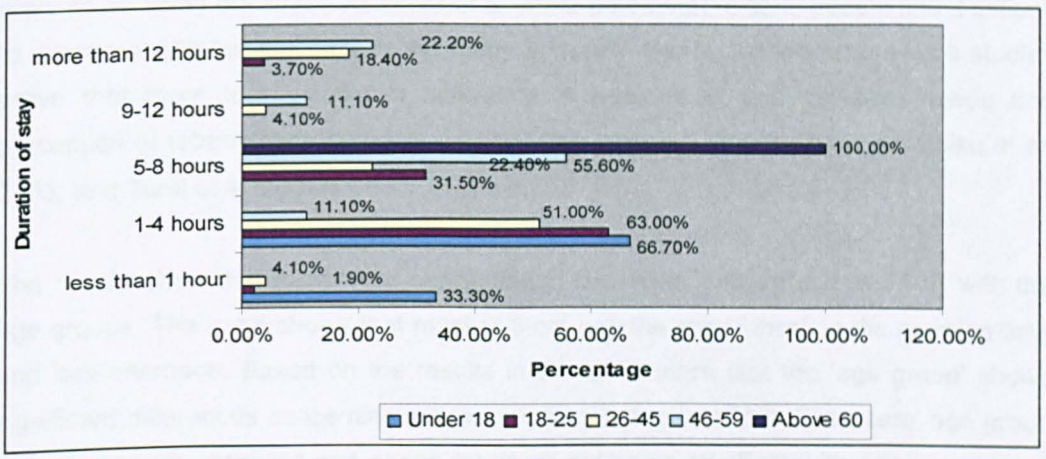


Figure 6.34: Cross tabulation between age groups and duration of stay in JTAR on occasional users

Source: Field survey (2009)

Based on the results for occasional users, only 2.6 per cent are in the group under 18 years old and only 0.6 per cent are above 60 years old. This shows that respondents under 18 do not spend more than 4 hours in JTAR. From this result, we can say that there are factors that make these two groups prefer not to stay long in JTAR. There are certain factors and a lack of attributes (unfriendly) in respect of this street that cause the younger group (under 18) and the elderly group (above 60) not to use the street. According to Matthew (1999) and Travlou (2007), open space is a place for the purpose of hanging out; it is an important space that presents a social forum for this group wherein which they are free to meet and talk with friends without family supervision. In

respect of the elderly group, the lack of mobility, ease of activity, safety, amenity, community and social connections affect their use of the street (Turel et al, 2007).

The results of the chi-square test show that there is a significant difference in the reasons they use the street in their free time (table 6.16). It was supported by findings from observation on activities along JTAR, where different age group choose different nodes for their activities and doing different activities. From the observations, it was found that the youngsters used the street to hang around with their friends and socialize with people of their own age. They used to tolerance with the place with many activities and congest with people along the street. Meanwhile for older group of people, most of them used the street for more passive activities such as sitting, reading and watching people passing through on street. They mostly avoid themselves in the area with too many activities. Such findings support the existing theories regarding different age groups have different reasons on using the street. As Carrs et al, 1992 noted that; elderly people find it difficult to tolerance with the places with too many activities. Hence, based on previous studies prove that there is a significant difference in reasons of use, physical needs and perception of urban space between different age groups (Forysth,2003; Sisiopiku et al, 2003; and Turel et al, 2007).

The results show that there were similarities in the users' time of use of JTAR with the age groups. The trend shows that most of them use the street more in the morning time and late afternoon. Based on the results in the Chi-square test the 'age group' shows significant differences concerning with whom they come to JTAR. The users' age group of less than 18 years old and above 60 years old come to JTAR with peers; while the group of users aged between 18- 45 always use this street alone (figure 6.35).

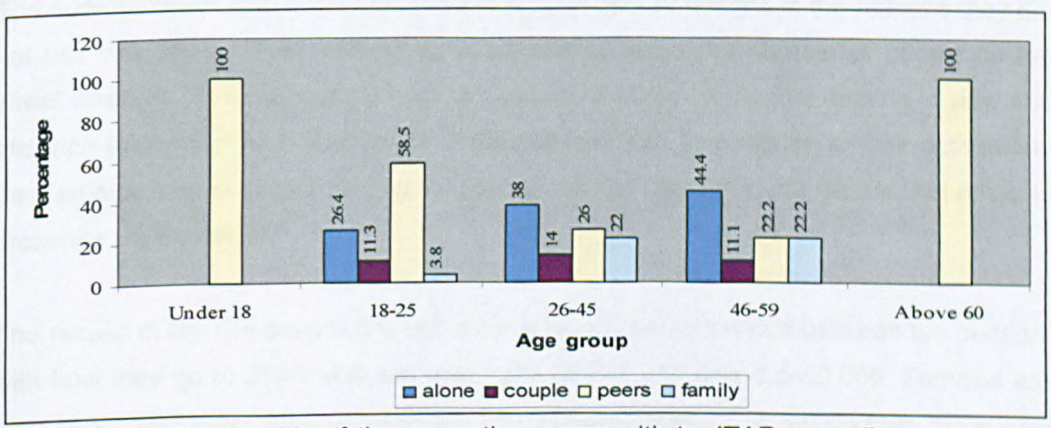


Figure 6.35: Relationship of the group they come with to JTAR according to their age group

Source: Field survey (2009)

Based on literature review, for the elderly group they are concern with accessibility, mobility, safety and ease of activity, therefore most of them used the street with family and peers (Turel et al, 2003). As for the younger group, they preferred to use the street with their own group rather than with family because according to Malone (2002), this group used the street as setting to escape from adults, socialize with their own age and expressing their own culture.

c) Gender

The results show that there is a similar trend in time spent in JTAR between genders. Both groups mostly spend between 1 and 4 hours in JTAR (figure 6.36). The results indicate that for the time spent of between 5 and 8, and 9 and 12 hours, the percentage of males is more (Figure 6.36).

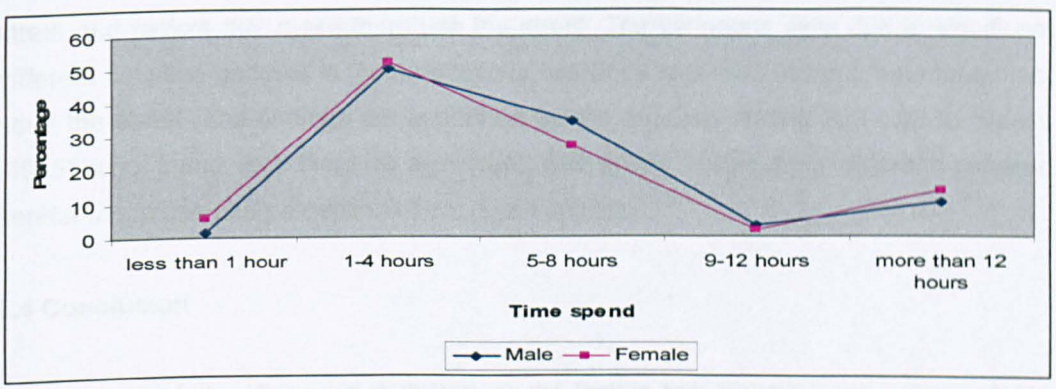


Figure 6.36: Relationship between gender and time spent in JTAR
Source: Survey (2009)

The survey results also show that there is a significant difference in the reasons they did not use this street. The male group is concerned about the number of people on the street whereas the female group is more concerned about the factors relating to view and distance (proximity) from their origin to their destination. This relates to their activities in that females love to shop including window shopping. Therefore, the factors that relate to proximity are important.

The results of the Chi-square (χ^2) test show a significant difference between the genders with how they go to JTAR with the result χ^2= 14.273, df= 4 and p= 0.006. Females are very dependent upon public transport to JTAR (Figure 6.37). The results from the survey of occasional users show that the majority of the female group use public transport - mainly LRT/ commuter (42.3%) and bus (15.4 %). While the male group prefer to use private transport like cars (44.1%) and motorcycles (23.7%).

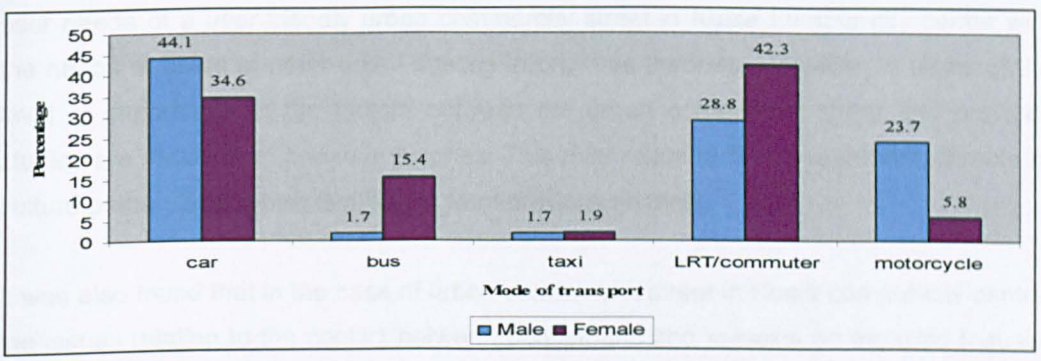


Figure 6.37: Relationship between modes of transport to JTAR by occasional user according to gender.

Source: Field survey (2009)

In short, the results show some variations between gender concerning how they use the street and factors that make them use the street. The variations exist due to significant different between genders in their attractions; activities and other factors that make them used the street. The findings are supported by the previous finding by Loukaito Sideris (1995) who found that there is significant differences obtain from different between gender in the use and perception of the urban spaces.

6.4 Conclusion

The purpose of this chapter is to determine the factors that make people use the street, their needs on the street and pattern of use, which contribute to a user-friendly urban commercial street in Kuala Lumpur city centre. It also sought to determine the variation in needs and pattern of use between different type of users and between different socio-demographic backgrounds. It was discovered that the needs of users on the street depends on factors; attractions; activities; proximity, level of congestion; and familiarity and length of engagement with the street. There are also other supportive factors that users need in street that can contribute to a friendly street. The factors are the presence of public spaces, greenery/trees, public amenities, maintenance and cleanliness and freedom of action. It was revealed that in respect of urban-commercial street in Kuala Lumpur city centre, the users' needs tended more to the functional factors compared to the physical factors.

The findings show that there were mostly similar factors in general user needs of user-friendly urban-commercial street in Kuala Lumpur city centre with the needs of people of urban public places from other countries. There was not much difference between the

user needs of a user-friendly urban commercial street in Kuala Lumpur city centre with the needs of users of other urban spaces in previous theories. However, in terms of the level of importance of the factors between the urban commercial street and previous studies are varies from previous theories. This may relate to the environment, climate or culture of the place, which is different from previous studies.

It was also found that in the case of urban-commercial street in Kuala Lumpur city centre, the issues relating to the conflict between pedestrians and vehicles on the road (caused by the street being monopolized by cars) and conflicts between pedestrians and street vendors on the sidewalk are serious. This contributes to the crowdedness on the street, which causes the street to become unfriendly thereby creating a feeling of stress, as well as being an unsafe and uncomfortable environment.

However, it was evidenced that different types of user have their own uses and activities on the street. This affects their level of need and the factors that make the street friendly to them. In this research, it was revealed that the group of occasional users were more concerned with the activities (especially necessary activities) on the street that make them use the street. While for daily users they need greater improvement of site conditions, site facilities and a site environment that is comfortable and conducive. As for the non-user group the lack of the factors mentioned above are the main reasons why the streets are not friendly to them. The group of user below 18 years old and above 60 years old were show more positive response towards ' the best place to earn money or income' as their main attraction that make them used JTAR. Meanwhile for the others age groups indicate 'the shopping centre' is their main attraction of JTAR. As for ethnic group of users, instead of 'shopping centres' and 'the best place to earn money and income', the 'Indian' group of users indicated 'public facilities' as other main attraction of JTAR, and 'Chinese' group of user indicated ' public spaces, buildings and landscapes' as the one of the main attractions in JTAR. This finding shows that the needs of users towards a friendly street are more affected by the uses and activities, familiarity with the street and time they spend on the street.

There is a slight variation in the pattern of use of the street between different socio-demographic backgrounds. There are only three groups show variations which are ethnicity group, age group and gender group. The ethnicity group show variation in terms of the reasons they used the street and the uses of the street during free time. The age group show variation in the aspect of duration of time they spend in the street and the group they come with to the street. As for gender group, the only variation is in the aspect

of mode of transport they used to go to the street. Therefore, there are many aspects in terms of the way users use the street are similar to each other group and only few aspects shows variation as per mention earlier.

Finally, the factors that make the streets friendly in this research were mostly similar with the previous theories. However, the attributes that contribute to the factors vary for each context. The attributes that contribute to the attraction of a street in Malaysia might be different from the attributes of attraction in other countries, especially countries with a different climate and economic level (between developing and developed countries).The following chapter discusses the qualities associated with user-friendly streets for different categories of user and socio-demographic backgrounds.

CHAPTER SEVEN

QUALITIES ASSOCIATED WITH USER-FRIENDLY STREETS FOR DIFFERENT CATEGORIES OF USER

7.0 Introduction

This chapter presents the findings on the analysis of data associated with the second and third objective of the research (a) to examine the attributes and characteristics of the street environment from the physical and functional qualities that make it friendly to different groups of user and (b) to determine the similarities and differences of a friendly street to people from different socio-demographic backgrounds.

In this chapter, the results from the surveys are based on a 4-point Likert-scale ranging from *strongly important* (1) to *strongly disagree* (4) (refer figure 7.1). In the analysis, results from the survey on the qualities appraisal were triangulated to further inform the results from the survey, interviews and observations.

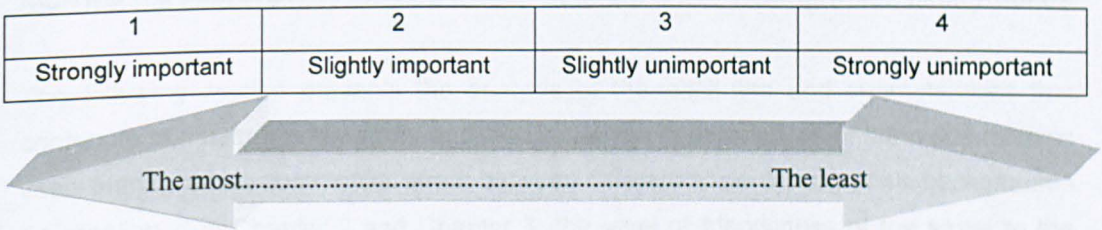


Figure 7.1: 4 Likert scale value range
Source: Author (2008)

In order to achieve the third objective, cross tabulation and the chi-square test are used. The frequencies of all variables and Chi-square (χ^2) test are used to assess the validity and significance of the variable's relationships in a contingency table. The relationship is only assumed to be statistically significant if the probability level is 0.05 or less. A significant relationship only shows the degree of association not what the association is, whereas the result of the chi-square test (χ^2) shows the degree of association between two variables. In order to look at the strength of the relationship the Spearman rho correlation test is used (table 7.1).

Size correlation coefficient (r)	Correlation strength
.91 to 1.00 or -.91 to – 1.00	Very strong
.71 to .90 or -.71 to -.90	Strong
.51 to .70 or -.51 to -.70	Medium
.31 to .50 or -.31 to -.50	Weak
.01 to .30 or -.01 to -.30	Very weak
.00	No correlation

Table 7.1: The strength of correlation coefficient based on Spearman rho test
Source: Adopted from Chua (2008)

The chapter is divided into two parts. The first part discusses the attributes and characteristics that strongly influence and contribute to a user-friendly street according to the type of user. The second part discusses the similarities and differences between different socio-demographic backgrounds concerning the attributes of a friendly urban commercial street in the Malaysian context.

7.1 Users' perception of the attributes and characteristics that contribute to user-friendly urban-commercial street; and variations in perceptions of attributes towards the user-friendly street between different socio-demographic backgrounds

The following section presents the analysis of the attributes and characteristics that contribute to a user-friendly street and also variations in perceptions of attributes towards user- friendly urban-commercial street between different socio-demographic backgrounds. As mentioned in Chapter 2 and Chapter 3, the level of friendliness of the street to the users can be divided into physical dimension, functional dimension, and social dimension. Under these dimensions, the main attributes that relate to a user-friendly street include the qualities of safety and security, comfort and convenience, and accessibility and proximity. The characteristics associated with the attributes will be analysed to further understand the level to which they influence a user-friendly street. In the analysis the results from the survey, interviews and observation were triangulated.

In this research the attributes discussed are the attributes with mean values below 1.50. These values are considered as the most important attributes based on users' perceptions. Based on the field survey results of the users' perceptions concerning the importance of the attributes shows that the attributes of safety and security are the most important (mean value: 1.50) followed by comfort and convenience (mean value: 1.52) and accessibility and proximity (mean value: 1.56). The implications from the survey show that the majority of the respondents have a positive perception of the attributes that

contribute to a user-friendly street (table 7.2). However, the results based on the mean value between qualities are only slightly different (table 7.2).

Qualities	Occasional	Daily	Non user	Mean Value
Safety and security	1.47	1.51	1.57	1.50
Comfort and convenience	1.42	2.02	2.02	1.52
Accessibility and proximity	1.56	1.58	1.55	1.56
Mean Value	1.48	1.70	1.71	1.53

Table 7.2: Summary of mean values concerning the importance of street qualities starting with the most important quality

Source: Field survey (2009)

Based on the mean value (Table 7.2) between three types of user, the occasional group shows a more positive response concerning the attributes of the place with the overall mean value (Table 7.2). However, between the daily user and non-user groups the difference is slightly different (Table 7.2). Between the three main qualities of a street, the survey results show that the occasional users have a more positive response, especially for the qualities of comfort and convenience. In respect of safety and security, it shows that the occasional group has a more positive response than others; however, the variation between the three groups is slightly different. Meanwhile, for the qualities of accessibility and proximity, as shown in table 7.2, the difference between the three groups is slight. This may reflect that the good qualities of the street are a prerequisite for the occasional group to use the street. This also shows that the perceptions towards the qualities of the street are related to the type of user activity on the street; the daily user group are the group that are normally involved with necessary activities while the occasional group are involved with optional activities. This is parallel with the ideas of Gehl (1987, 2010) in chapters 2 and 3. Table 7.2 also shows that most of the daily users are in the group that relates to necessary activities. This group will use the street in any condition because they have to. Therefore, we can relate that the reasons for using the street may affect their perceptions and preferences concerning the street.

Qualities	Age group	Gender	Ethnicity	Mean Value
Safety and security	1.47	1.46	1.46	1.46
Comfort and convenience	2.25	2.24	2.24	2.24
Accessibility and proximity	1.63	1.64	1.64	1.64
Mean Value	1.78	1.78	1.78	1.78

Table 7.3: Summary of mean values concerning the importance of street qualities by 'age group', 'gender', and 'ethnicity' of users
Source: Field survey (2009)

Based on the mean values between users from different socio-demographic backgrounds (table 7.3), all three groups of users (gender, age group and ethnicity) show similar response concerning the attributes of the place with the overall mean value (scale 1.78). However, between the three main qualities of the street ('safety and security', 'comfort and convenience' and 'accessibility and proximity'), the result shows that all three groups of users have more positive response for the qualities of safety and security (scale 1.46) compared to the other two qualities (table 7.3). The results also shows that between three main qualities of the street concerning by 'age', 'gender' and 'ethnicity' group of users, qualities of comfort and convenience are the less important compared to the others (scale 2.24).

In terms of variations in perceptions of attributes towards user-friendly street between different socio-demographic backgrounds, the analysis was mainly based on the quantitative data from the reports of the survey findings. The way in which attributes were considered important was also analysed based on the different socio-demographic background of the users. The discussion only concerns the attributes that show variations based on significant difference (Chi-square test) and the correlation strength based on the Spearman-rho test. The attributes not discussed under this section mean that they showed similarities in users perceptions and socio background towards that attribute. This section relates to the qualities that fit and do not fit with certain groups of users from different socio economic backgrounds. Krupat (1984, p.13) *'I am sure that there are many readers whose choice would be just the opposite, but it should be clear that the point is not who is right and who is wrong, but whichever the preference, whether it is right for that person'.*

7.1.1 Safety and security

Attributes and characteristics of safety and security that contribute to user-friendly urban-commercial street

The results of the surveys concerning the criteria of safety and security that encourage people to use JTAR indicated higher positive responses. Based on the survey, the scale of 1.50 for the overall mean value under safety and security attributes shows that it is a very significant factor that makes a user-friendly urban commercial street (Table 7.5). The result also supported by the non-user group of respondents who stressed that safety factor is the main factors that need to improve in JTAR in order to create a user-friendly street environment (refer chapter 6).The following section discusses the characteristics that define the safety and security of the street. However, it is important to highlight here the attributes of safety and security that are the most/least important in the context of Malaysia. This analysis shows that the lower the scale of the result, the more significant the quality. The scale of 1.21 – 1.89 of the attributes show that safety and security qualities are important to encourage use of the street in respect of JTAR (see table 7.4).

This finding is parallel with Burton et al (2006) who found that safety is an essential characteristic for street life. This is also supported by Gehl (2010), who noted that the feeling of safety is important to attract people to use the city space and that people themselves make the city more inviting and safe in terms of both experienced and perceived security. Hence, in Malaysia itself, the National Urbanisation Policy 2006 (NUP) was formulated to increase the effectiveness in the quality of the urban environment that stipulates the need to create a safer environment in Malaysian towns.

	Safety qualities	Occasional	Daily	Non-user	Mean Value
a	Presence of security officials and police patrols	1.19	1.24	1.19	1.21
b	Low crime statistics	1.25	1.44	1.25	1.34
c	Free of accidents	1.26	1.39	1.35	1.34
d	Safe crossing devices	1.36	1.39	1.46	1.39
e	Safe environment for elderly, disabled and children	1.42	1.45	1.32	1.41
f	Free of presence of anti-social behaviour	1.36	1.47	1.37	1.41
g	No graffiti and vandalism	1.39	1.51	1.49	1.47
h	Low traffic flow and speed	1.58	1.51	1.74	1.57
i	Presence of people	1.74	1.74	1.93	1.77
j	Presence of activities	1.76	1.72	1.98	1.78
k	Full of activities day and night	1.91	1.78	2.18	1.89
	Mean Value	1.47	1.51	1.57	1.50
	Response format 1= strongly important 4= strongly unimportant				

Table 7.4: Degree of safety and security attributes based on mean values based on the most important attributes

Source: Field survey 2009

The results from Table 7.5 also show that all groups indicate that the attributes of safety and security are the most important (Occasional: 1.47; Daily 1.51; Non user 1.57). Of the three groups of user, the results of the survey show that the occasional group of user perceived safety and security aspects more followed by the non-user group. The occasional users perceived the importance of the presence of security and police officers, free of accidents, low crime statistics and free from presence of anti-social behaviour more than other attributes; this relates to their feeling of safety for conducting activities on the street (table 7.4). However, the non-user group perceived inclusive environments that are safe for all as the most important. Table 7.4 shows that of the three groups, the daily group perceive the importance of safety and security attributes a bit less than the other groups. This may relate to their sense of belonging to the place and also familiarity, which contributes to the feeling of safety in that place. The results based on the mean value survey also indicate that the presence of people and activities are less important attributes compared to the other safety and security qualities (table 7.4).

	Safety qualities	Age group	Gender	Ethnicity	Mean Value
a	Presence of security officials and police patrols	1.21	1.21	1.21	1.21
b	Low crime statistics	1.34	1.34	1.35	1.34
c	Free of accidents	1.34	1.34	1.35	1.34
d	Safe crossing devices	1.34	1.39	1.35	1.36
e	Safe environment for elderly, disabled and children	1.41	1.42	1.39	1.41
f	Free of presence of anti-social behaviour	1.41	1.41	1.41	1.41
g	No graffiti and vandalism	1.47	1.46	1.47	1.47

Response format
1= strongly important
4= strongly unimportant

Table 7.5: Degree of safety and security attributes based on the most important attributes by 'age', 'gender' and 'ethnicity' group of users.

In terms of the importance of safety and security attributes between 'age', 'gender' and ethnicity' group of users, the result shows that all three groups indicate a similar pattern with the 'type of users' group where 'the presence of security and police officer' remain the most important attributes that contribute to safety and security of the street (table 7.5). All groups of user perceived similar pattern in their perceptions towards the importance of the attributes of 'presence of security and police officer' (scale 1.21) and 'free presence of anti-social behaviour' (scale 1.41). However, the 'age' group of user perceived 'safe crossing devices' attribute a more than other groups (age group: 1.34, gender: 1.39, ethnicity: 1.35). As for the 'ethnicity' group, they perceived 'safe environment to elderly, children and disabled' attribute more than the other two groups (age group: 1.41, gender: 1.42, ethnicity: 1.39).

The safety and security factor may affect how people use the street and the feeling of safety and security in places can make people use the street comfortably. People may act differently when they feel unsafe when using the place or try to avoid using it altogether. The respondents were asked about their feeling of safety when using JTAR alone. The results indicate that 60.2 % of the users in JTAR do not feel safe to use the street alone (table 7.6).

	Frequency	Percentage (%)
Yes	137	39.8
No	207	60.2
Total	344	100

Table 7.6: Users' perceptions of the feeling of safety in JTAR

Source: Field survey (2009)

This is supported by the results from the survey based on how they use the street, in which the majority of the users use the street with their peers. Table 7.7 indicates that most of the users (43.1%) come to this place with their peers, 31.9 % like to come here alone followed by with their family 12.9% and the remaining 12.1% as couples. The main reason mentioned in the study for preferring to come with their peers is because they feel more comfortable, safer and it facilitates their leisure and discussion needs.

	Frequency	**Percentage (%)**
Alone	37	31.9
Couple	14	12.1
Peers	50	43.1
Family	15	12.9
Total	N=116	100.0

Table 7.7: Groups and who they come with to JTAR

Source: Field survey (2009)

The results show that users in the age group that are less than 18 years old and above 60 prefer to come to this street with their peers. Based on the observation on site also support that result where most of these age group (the younger and older group) used the street with their company. This could be these age groups prefer to have company when using the street or doing activities outdoor. These findings support Burton et al (2006) and Turel et al (2007) who highlighted that the younger and older group of people have different preferences and perceptions towards open spaces that may affect the way they use the space. However, the group of users' aged between 18 and 24 years old always use this street alone. The percentage shows that few of them use the street with their family, which may be because the street environment and facilities that are provided in JTAR are not friendly to them. In summary, this finding do support the statement by Forsyth (2003) who stress that, different age groups perceive the open space differently. The respondents were also asked about the reasons they do not feel like using the street alone. The four main reasons mentioned in the survey were, there are a lot of migrants in

that area (31.6%), high crime rate (20.8), lack of supervision by police (12.2%) and the environment of the street is too crowded(10.5%) with traffic and people (Figure 7.2).

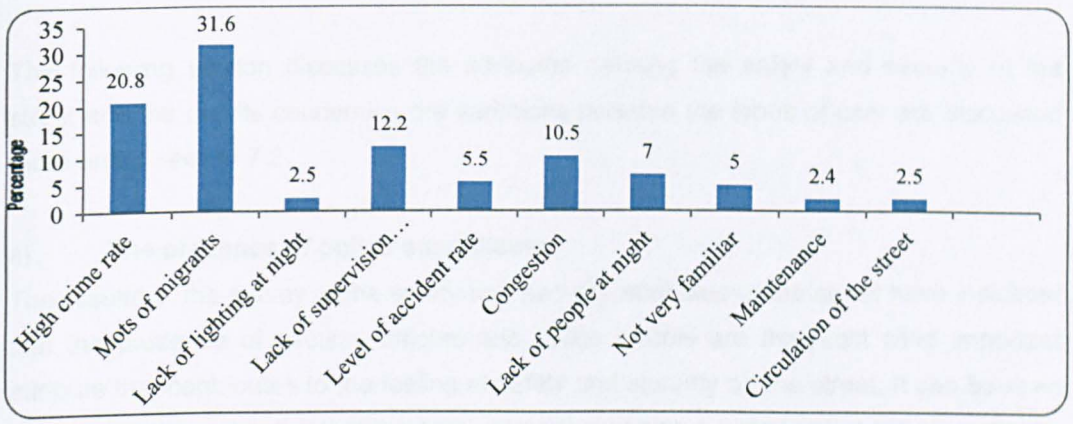


Figure 7.2: Reasons for not feeling safe in JTAR
Source: Field Survey (2009)

Figure 7.2 indicates that the main reason for not feeling safe using the street (JTAR) alone is due to the presence of migrants (31.6 per cent). Based on the interview survey most of the respondents walk within the area of Maju Junction and until the end of the shop lots towards Dataran Merdeka, but prefer not to walk around the Chow Kit area because of the presence of many outsiders/migrants in that area. This is reflected by the comment of respondent no 2.

" Normally I try to avoid walking alone in the area with less people and the area with lots of migrants, especially back lanes and the Chow Kit area because it makes me feel unsafe and out of place" (Female)

The issue of immigrants has already been discussed by Ehrenfeucht et al. (2010). They argued that conflicts often arise between different groups of people in the street. They also add that the conflicts arise between bourgeois public order and counter public (immigrants), various working class ethnic groups and others who claim the sidewalk for economic, social and political activities in various ways and at various times. For this reason, based on observation of JTAR, most of the street vendors were managed by Indonesians. Based on the interviews many people consider their presence in the city as problematic. The presence of migrants in many locations also creates conflicts with other public groups (Krupat, 1985). The other main issues indicated in the survey (Figure 7.2); concerning the reasons that make the user feel unsafe to use the street, include the high crime rate and lack of supervision by police, which will be discussed further in the sections below, while, the congestion issue has already been discussed in Chapter 6.

Based on the results, it is shown that the factors relating to the activities, such as the presence of activities and the presence of activities day and night do not have an important rate for safety and security aspects compared to the other attributes.

The following section discusses the attributes defining the safety and security of the street and the results concerning the variations between the types of user are discussed more under section 7.2.

a) The presence of police surveillance

The results of the survey of the safety and security attributes of the street have indicated that the presence of security officers and police patrols are the most cited important attribute that contributes to the feeling of safety and security on the street. It can be seen from the data in table 7.2 that the scale of 1.21 suggests a very positive response to the presence of security officers and police surveillance on the street to ensure a safe environment and feeling of being safe on the street. The result of the survey show that based on the three groups of user, the occasional and non-user group strongly expressed about this matter compared to the daily users (Occasional: 1.19 ; daily:1.29 ; Non-user: 1.19). As for the non-user group this may be one of the key factors why they do not use JTAR. Hence, the daily group are much more familiar with the street and have been engaged with the street for a long time, which makes them feel safer and more attached to the street. The results also shows positive responds of the most important attributes that relate to safety and security of the street perceived by the respondents from the 'age', 'gender', and 'ethnicity' groups.

The importance of the presence of police and security surveillance is also supported by the results of the survey in Chapter 6, in which the respondents stressed this attribute as one of the attributes that need to be improved in JTAR (figure 6.18). In addition, based on result on survey it shows that one of the reasons users do not feel safe using JTAR alone is because of the lack of supervision by security officers and police (figure 7.2). The most intriguing point to emerge from the result is that the results from this survey was supported with most of the previous authors who noted that natural surveillance is one of the key factors in contributing to the feeling of security and safety on the street, as Jacobs (1961, p.40) stressed in her book:

'The first thing to understand is that the public peace - the sidewalk and street peace -of cities is not kept primarily by the police, necessary as police are. It is kept primarily by an intricate, most unconscious, network of voluntary controls and standards among the people themselves, and enforced by the people themselves'.

However, for some people the presence of the police surveillance on street gives the kind of feeling of uncomfortable due to thinking that their behaviour and activities been watched by them. This is reflected by the comment of respondent no. 8.

"I feel uncomfortable; automatically when I see police around I feel that they are looking for our fault because that the nature of their job looking for peoples' faults".

(Respondent 8: Male)

Based on the observations of JTAR, increasing pedestrian visibility by placing windows, doors and "eyes on the street" can increase the pedestrian's sense of security on the street and at the same time increase the number of people using that place. This was supported by most of the respondents in the interview survey. Based on this we can say that in Malaysia, people still have trust in and rely on the presence of police unlike in European countries. Therefore, the presence of police surveillance and security officers is important for them to feel safe on the street. The feeling of safety is subjective to discuss, as it is different to different people. This contradicts the results of different respondents regarding this matter, which shows that the presence of police surveillance on the street might have a different impact on different people. Daily users, for example, felt more secure in using the street without the presence of police surveillance due to the familiarity and greater attachment and the sense of belonging to the street, while for the occasional group, some of them feel more secure and safe when they see the presence of police on the street. This scenario is subjective to different people. This is supported by the initiatives of the JPPD and Ministry of Housing and Local Government, which introduced 23 strategies under the Safe City Programme 2010 to reduce crime in urban areas. One of the strategies is locating police posts and mobile stations in the locations with high crime rates in urban areas.

b) Free of accidents and low crime statistics

The increasing level of crime and insecurity in urban areas is a worldwide phenomenon. Many studies have repeatedly found that the main criteria for good open spaces are being safe from criminals and free of accidents. The finding in this research also highlighted that 'free of accidents and low crime statistics' are among the most important attributes that contribute to the feeling of safety to use the street. The result in the survey also indicated that 'free of accidents' and 'low crime statistics' are also the most important attributes that perceived by 'age', 'gender' and 'ethnicity' groups of users (Age: 1.34, Gender: 1.34, Ethnicity:1.35) .

Talha (2008) suggested that, fear of violence and crime has discouraged people, especially women, children and older people, from using streets and other public spaces. In the Malaysian scenario, the police report also highlighted that statistically there is a close correlation between the numbers of crimes reported to that of the population growth over the last 30 years. In respect of crimes related to the street, snatch thefts constitute 12% of the overall crimes that frequently occur in places like bus stops, commuter stations and along main roads. The thief usually rides on a motorcycle, and snatch thefts are also becoming more frequent because there is no separation between the pedestrian walkways and the main roads (Talha, 2008). Low crime statistics and free of accidents gives explain to the safety of a place. In the case of street and city spaces these two attributes have been widely discussed by previous authors (Jacobs 1961; Appleyard, 1981; Carmona et al., 2003; Gehl, 2010). Security is also an important consideration, since pedestrians will feel more vulnerable than motorists in many circumstances. As shown in table 7.2, the importance of this attribute was strongly expressed by the occasional users and the non-users. Even though based on users' perception the 'low crime statistics' attribute is more important than the 'free of accidents' attribute (Table 7.2), it was observed that in JTAR the conflict between pedestrians and motor vehicles (accidents) is more crucial compared to crime issues.

It was observed that in JTAR, the street is dominated by motorists. This is because the street is very linear and in zone 1(Chow Kit area) and most of zone 2 (from Maju Junction to SOGO area) the width of the street is quiet wide (4 lanes), that encourage the traffics (refer to chapter 5). Hence, it was observed that the attitude of drivers of cars and rider of motorcycles that think the road belongs to them and that pedestrians should give priority to them makes some of them disobey the rules on the road, such as by not reducing speed and stopping for pedestrians. In the case of JTAR, people walking along the streets can be seen by drivers and other pedestrians, however, the traffic speeding along cause the pedestrians to feel unsafe. As referred to in the Urban Design compendium, natural surveillance and slow traffic flow will encourage the feeling of safety and at the same time encourage people to walk along the street. The character of JTAR contradicts with what Krier (1991) noted in the literature in that commercials street should be relatively narrower than residential streets, so that the street users can easily view over the goods on display in the shops without having to cross the road.

The results of the survey and interviews show that the majority of the respondents are concerned about the segregation of pedestrians and vehicular traffic for safety purposes. However, as long as the street is dominated by cars (traffic) and not the pedestrians it is

still not friendly to the users of the street. Based on observation there is also no buffer or segregation between the walkway and the road. Even though the pedestrians already have their own "walking space" by buffering pedestrians from passing cars, especially in areas with a narrow walking space will increase the feeling of security to the users. According to Russ (2002), street design plays an important role in creating an environment that is safe and secure to pedestrians. In addition, by using planting strips or landscaping as a buffer makes the environment more attractive, which contribute to the feeling of comfort.

Another factor that contributes to accidents is street vendors who occupy the road and sidewalk (Figure 7.3). The presence of the street vendors gives positive and negative impact to the street, the positive impact is enhances the lively street environment and appearance of the street (Yatmo, 2008) and the negative impact is when the vendors occupy the pedestrian walkway especially the narrow sidewalk it may invite danger to pedestrians that walking along.

Figure 7.3: Street vendors operate on the sidewalk causing people to walk in the danger zone.
Source: Field study 2008

Based on observation, the physical factors of JTAR, which is linear and extends to a length of about 2.48 kilometres, only certain nodes become the focus of activities. In addition, in certain areas where there are fewer activities and less people it makes the area feel unsafe, especially for females. In JTAR most of the activities are focused in the southern area compared to the northern section. Based on the interviews most of the respondents, especially women, mentioned that they do not feeling safe to walk in the Chow Kit area (north side of JTAR), because of the history of the place, drug trafficking activities, prostitution and black market. Based on the respondents' comments, they are

worried about pick pockets more than other criminals on the street. This is the most common crime that happens on this street and the most unsafe area along JTAR. This was addressed by Jacobs (1993) who suggested that the problems of streets that have unsafe environments could be addressed by encouraging activities and people everywhere along the street and not just focusing on certain nodes.

It was also observed that there is graffiti in some areas of JTAR, especially in the areas that lack people and activities. The presence of graffiti in that area gives different perceptions to different people. According to Creswell in Yatmo (2008), the presence of graffiti in public places has two meanings: crime and as art.

In summary, we can conclude that safety from crime and accidents is very important and encourages people to use the street and makes the street friendly to them. This is in line with Jacobs (1961), who stressed that safety refers to the streets that enable the people to use, enjoy and move around the outside environment without fear of crime and fear of tripping or falling. This is also supported by Rapoport (1990) and Carmona et al. (2003) who add that safety in the street mostly relates to crime and fast moving vehicles on the streets. In conjunction with this, National Urbanisation Policy in NUP 23(Safe urban environment) under Thrust 5 (Creation of a conducive liveable urban environment with identity) suggests five measurements in creating safe urban environment (JPBD, 2006). Hence in 2010, JPBD introduced a Safe City Guide Book as one of the initiatives to increase safety in urban areas. Out of the four components that feature in the safe city concepts 2010, one of the initiatives is to reduce the number of accidents and the other is to reduce the crime rate in urban areas.

c) Safe crossing devices

The findings from the survey indicate that safe crossing devices are one of the most important attributes that contribute to a friendly street. The results show that the occasional (scale of 1.36) and daily users (scale of 1.39) are the groups that are most concerned compared to the non-user group (table 7.2). In JTAR two types of pedestrian crossing devices are provided overhead pedestrian crossings and zebra crossings with traffic lights (figure 7.4).

i) Overhead pedestrian crossing ii) Zebra crossing with traffic lights

Figure 7.4: Types of crossing device along JTAR

Source: Site study (2008)

The finding is also supported by the results from the interviews and observations on site. It was observed that the presence of safe crossing devices is another key attribute in supporting the feeling of safety and security in using the street. According to respondent's no 20, pedestrian crossing is very important for pedestrian safety to cross the street especially in area that is busy with traffics.

According to the survey, the occasional group and age group of users expressed the most concern in respect of the need for adequate and safe crossing devices. This is because most of them use the street for shopping purposes and bring many bags and sometimes come with their family. It was observed that there are some areas along the study street that not provided with pedestrian crossing such as in front of Sogo shopping block where supposed according to Malaysian standard 1331(2003), at busy shopping areas and the area where the number of vehicles exceeds 300 per hour, pedestrian crossing should be provided.

Result from observation in JTAR found that most of the users used the zebra crossing compared to overhead crossing. However both types of the crossings provided are not fully used by the street users to cross the street in JTAR. Based on observation the people prefer to cross the road illegally rather than use the crossings provided. This is due to many factors, the first reason being the width of the street. In JTAR, especially in the first zone (Chapter 5), the street is too wide with 4 lanes, and with the cars speeding, even though a crossing is provided and the traffic lights turn red for cars to stop, people still are not confident to cross and it is impossible for the disabled to cross. The wider the street, the longer it will take to cross, therefore, the longer pedestrians will be exposed to

vehicular traffic. In the Chow Kit area, the crossing distance is about 15 metres across (refer to Appendix 5). The allocated time to cross is not sufficient for certain groups of users especially when heavily loaded with shopping. It is even worse when some of the motorists and especially bikers, do not follow the stop signal. This is supported by the comments from respondent's no. 1 and 4:

"it's very dangerous there, even though pedestrian crossings are provided and traffic lights to help pedestrians to cross the street I am still not very confident to cross, because the drivers love to speed and sometimes they do not stop when the traffic light turns red'(Respondent 1 :Male).

"It is too scary to cross here because the street is too wide and sometimes the motorists especially bikers do not stop for the red stop signal" (Respondent 4: Male).

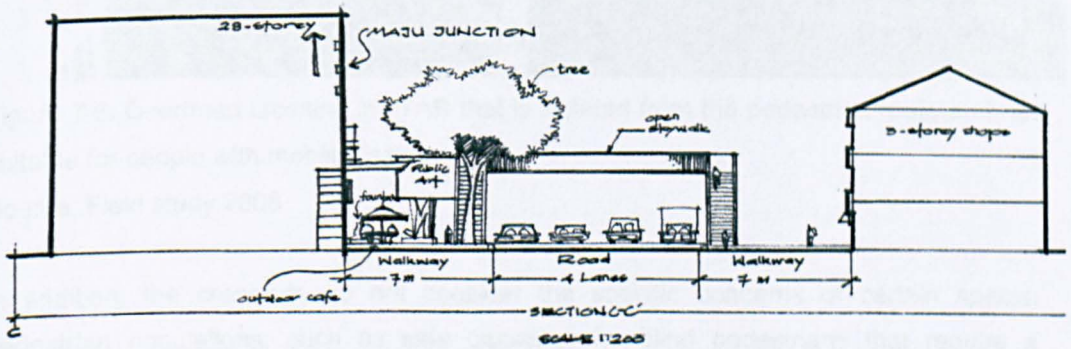


Figure 7.5: Overhead crossing in JTAR
Source: Field study 2008

Therefore, ITE (2006), also came out proposed recommended practice for wide street that one of the solution to reduce the width of the street is curb extension which to extend the line of the curb into travelled way. This not also reduce pedestrian crossing distance but also give exposure to traffic by improving driver and pedestrian sight distance and visibility. It is also resulting in calming effect (ITE, 2006).

Another reason is that the overhead crossing is not suitable for those with mobility issues, such as pregnant women, women with shopping bags or strollers, elderly people and children. This is supported by the result from the survey where the age group of users perceived that safe crossing devices is one of the most important attributes that contribute to the uses of the street. It is impossible to these groups to climb up the stair case with no other supportive facilities provided such as a ramp or escalator (Figure 7.5).

Due to the height, the overhead crossing is also away from street level and lacks pedestrian surveillance, which contributes to the feeling of insecurity to the pedestrians (Figure 7.6). Whyte (1980) argued that, putting spaces away from the street level like sunken spaces or roof top urban spaces is not convincing in terms of safety.

Figure 7.6: Overhead crossing in JTAR that is isolated from the pedestrian route and not suitable for people with mobility issues
Source: Field study 2008

In addition, the crossings do not consider the specific concerns of certain special pedestrian populations, such as safe crossings for blind pedestrians that require a different set of design features than those for general pedestrians. Sometimes the stop signals for crossings are not clear. The sounds for the stop signal that allow people to cross the road are also not loud enough, which makes it difficult for people to hear and impossible for people with sight problems. From observations on site, it was also found that at the pedestrian crossing area, there is no proper refuge for pedestrians (waiting space), especially at the areas with narrow walkways, and that the traffic calming system is insufficient to slow down oncoming traffic to provide an adequate time to cross the street. This is also supported by the study conducted by Shamsuddin et al. (2010).

d) Safe environment for elderly, disabled and children

A safe environment for all, especially the elderly, disabled and children, is one of the significant attributes that make the street feel safe and secure to the users. A safe environment is more related to the physical condition, pavement condition, maintenance of the street and no clutter along the street. The result from Table 7.1 indicate that the non-user group expressed the importance of inclusive environments for all users

including the elderly, disabled and children the most (Occasional: 1.42, Daily: 1.45; Non-user: 1.31).

This attribute is mostly affected by perception of the physical environment and users experience in using the street. This is related with the easy to get by foot, which reveal as the most important criteria to encourage users to use the street. Therefore the detail discussions regards to the safe environments to elderly, disabled and children are in later section (7.1.3 (c)).

e) Free of the presence of anti-social behaviour

Free of the presence of anti-social behaviour attributes on the street is closely linked with the feeling of safety and security in the physical and physiological sense. The results from the survey shown in Table 7.1 indicate that all the respondents strongly identified this attribute as important to make a street safe and secure (Occasional: 1.36; Daily: 1.47; Non-user; 1.37). The finding is also supported by the result from the survey by age, gender and ethnicity group of users who also positively indicated that this attribute is important to make them use the street (scale 1.41). The results from the observations in JTAR show that people tend to avoid using or passing through spaces that have people acting anti socially. This is supported by the findings from the interviews during which it was expressed that they normally avoid walking through the Chow Kit area or using that area due to the feeling of being unsafe and insecure. In fact, in the Chow Kit area there are many migrants that make users feel that this is not the place to be (figure 7.7). Based on observations of this area, the presence of immigrants, especially from Indonesia and Bangladesh play a role in changing the image of the street. As Cullen (1996, p.12) stated a *"human being is constantly aware of his position in the environment, that he feels the need of sense of place and that this sense of identity is coupled with an awareness of elsewhere".*

Figure 7.7: The presence of undesirable people that reflect the feeling of insecurity and being uncomfortable in JTAR

Based on observations on site, graffiti and loitering groups make other groups of users feel uncomfortable. Street users, especially women feel insecure to use the street when there are groups of youngsters loitering along the street. However, this street does not have a many spots for youth loitering, most of the young group only found at the Pertama complex area and Maju Junction area. This may relate to different age groups having different attractions and intentions towards JTAR. According to Tibbalds (2001), although these groups do not disturb people physically, they create a feeling of psychological insecurity. The presence of migrants and beggars, especially in the Chow Kit area also gives the user the feeling of insecurity. According to respondent no. 2; *"I don't have confidence to use JTAR alone because there are many strangers/ migrants here such as Bangladeshi and Indonesians that make me feel it is not my place and unsafe and sometimes also our local people don't even bother if we face any problem there." (Female)*

Variations in perceptions of safety and security attributes between different socio-demographic backgrounds

a) Variation according to type of users

The results of the chi square test between safety and security attributes and users socio-demographic backgrounds show that there is a significant difference in certain attributes. Based on the chi-square test concerning safety and security attributes (see table 7.16) and types of user , attributes such as the presence of activities on street, the presence of activities day and night, low crime statistics and no graffiti and vandalism are the variables that had a significant relationship with the types of user. However, based on the results for the strength of the relationships, it shows that the Correlation coefficient Spearman rho relationship between types of user and the attributes of safety and security

are very weak. This means that there is a significant difference in the relationship between type of user and the attributes of safety and security but not very strong. The strength of the correlations show that the correlation between them with the r less than 0.3 (table 7. 8).The results of the survey show that the occasional users group are more concerned about safety issues compared to the daily users' group.

Variables	Presence of activities	Activities day and night	Free of accidents	Low crime statistics	No graffiti and vandalism
Types of user	χ^2= 14.346, df=6, p= 0.026	χ^2= 16.524, df= 6, p= 0.011	χ^2= 10.062, df= 4, p= 0.039	χ^2= 13.828, df= 2, p= 0.001	χ^2= 15.326, df= 4, p= 0.040
	r=.074, p= .151	r= .062, p= .252	r= .086 p=.111	r=.066 p= .221	r= .067 p= .215

Table 7: 8: Chi-square test results and Spearman rho correlation test on safety and security attributes with types of user.
Source: Authors (2009)

The daily users show a more positive response concerning the attributes that relate to the presence of activities on the street and availability of activities day and night that contribute to the feeling of safety and security in using the street. For the occasional and non-user group they are more concerned with the attributes that involve personal safety, such as low crime statistics, free of accidents, and no graffiti and vandalism. This may reflect that the daily users better understand the actual level of crime and number of accidents as well as the graffiti and vandalism on JTAR because they use the street every day and are familiar with the place. For this group, activities on the street that make the street liveable day and night and brings more people there, and, at the same time, creates a safe environment are more important for them to do business, trade and others. The daily users are the group of objective determinants who feel the actual safety in the street (Krupart, 1984). However, for occasional users and non-user their preferences are based on their belief about safety in the street. They are subjective determinants (Krupart, 1984) who believe that the street is a place with a high crime rate, high accident level and full of vandalism and graffiti.

In summary we can say that the users' perceptions concerning the attributes that relate to safety and security that can make them use the street are only slightly different between different types of user. There are slight differences/ variations between the safe and

security attributes with the socio background groups (table 7. 9).Based on the chi square test it is observed that more attributes show a significant difference with age group than other groups. The other groups that show a significant difference with safety and security attributes are education group, occupation group and distance from residence group.

b) Variation according to age group

In terms of variation of five main attributes ('the presence of police surveillance', 'free of accidents and low crime statistics', 'safe crossing devices', 'safe environment for elderly, disabled and children, and 'free of the presence of anti-social behaviour') that related to safety and security on the street with the age groups, only two attributes show a significant difference which are 'free of accidents and low crime statistics' and 'safe crossing devices'. It was found in this research that there are similar patterns in perceptions of other three most important attributes that contribute to safety and security of the street between different age groups.

The importance of police and security show a positive response on the age groups of users compared to other attributes (under 18: 1.00; 18-25: 1.24; 26-45: 1.24; 46- 59: 1.24; above 60 : 1.20). However, there was little variation between the four groups in terms of the importance of 'presence of police surveillance' that relate to the uses of the street. The result shows that group of users 'under 18 years old' and 'above 60 years old' are strongly expressed the importance of this attribute that contributes to the feeling of safety and security on the street. In terms of perceptions on 'free of accidents' and 'low crime statistics' all the five age groups indicated the importance of these attributes that contribute the uses of the street. The slight variation found between the age group was that the group of user within (18-44) perceived that the ' low crime statistics' attribute is more important than 'free of accidents' attribute that make users used the street.

In respect of the chi test on significant differences between the qualities of safety and security and age groups, the attributes that show a significant difference are the presence of people, presence of activities, safe crossing devices, free of accidents and low crime statistics (table 7. 8). However, based on the strength correlations (Spearman rho test) for these attributes, which show a significant difference, only four of the attributes show a significant correlation, with weak correlation strength and significant correlation at the 0.01 level (table 7.1). The other two show a very weak correlation. Under the attributes of presence of people, the younger (under 18 years old) and the older (above 45 years old) answered that the presence of people on the street is slightly important to make them use the street. The group aged above 18 to under 45 years old stressed that the presence of

people is very important to encourage them to use the street and at the same time provide a feeling of safety and security. The presence of activities also shows a significant difference according to age group. The results also show a similar trend with the presence of people where the group of people aged between 18-45 years old show that the presence of activities is very important to encourage and make them use the street (table 7.10). The results on strength of correlation based on the Spearman rho test show that there is no significant correlation (very weak).

Variables	Presence of people	Presence of activities	Safe crossing devices	Activities day and night	Free of accidents	Low crime statistics
Age	χ^2= 57.473, df=12, p= 0.00	χ^2= 24.904, df= 12, p= 0.015	χ^2= 19.368, df= 8, p= 0.013	χ^2= 26.239, df= 12, p= 0.010	χ^2=16.812 df= 8, p= 0.032	χ^2= 10.810, df= 4, p= 0.029
	r= .148 p= .006**	r= .010 p= .847	**r= .189** p = .000**	r=- .044 p= .420	**r= .163** p = .002**	**r= .150** p= .005**

Table 7:9: Chi square test results and Spearman rho test on safety and security attributes with demographic factors.

Source: Authors (2009)

	Under 18	18- 25	26-45	46-60	Above 60	Mean Value
Presence of people	2.30	1.65	1.67	2.01	2.20	1.97
Presence of activities	2.30	1.76	1.73	1.82	1.90	1.90
Safe crossing devices	1.30	1.30	1.41	1.50	1.70	1.42
Activities day and night	2.30	1.93	1.79	1.91	2.10	2.00
Free of accidents	1.30	1.28	1.30	1.47	1.70	1.39
Low crime statistics	1.30	1.28	1.31	1.47	1.60	1.39
Mean Value	1.8	1.53	1.53	1.82	1.87	
Response format 1= strongly important 4= strongly unimportant						

Table 7.10: Degree of safety and security attributes based on mean values, which shows a significant difference according to age group

Source: Field survey 2009

For safe crossing devices, there is a significant difference based on the chi square test, and the strength of correlation is significant at the 0.01 level. The respondents' aged below 60 years old quoted that safe crossing devices are very important and the highest percentage is the group under 18 years old. While the respondents above 60 years old responded that the safety crossing devices is slightly important. This may explain that the group of respondents above 60 are not really reliant on crossing devices and that they do not trust using such facilities or they are the group that rarely use the street. Based on observation in JTAR, there are very few users from this group (above 60) used pedestrian crossing devices. In activities day and night the users' age group (26-45) gave the most positive response followed by age group (46-60) and (18-25). The group aged under 18 and above 60 years old responded that the presence of activities day and night were slightly important to them (table 7.10). This is supported by Carr et al. (1992), in that elderly people find it hard to tolerate with too many activities in place. A similar trend was shown for the variations on the attributes of free of accidents and low crime statistics with the aged group. The group between 18-25 years old show a more positive response for these two attributes compared to the other age groups. This may because they are the main users of the street.

In summary, compared to other age group, the elderly group perceive differently and have different physical needs towards user-friendly street. This statement is supported by Forsyth (2003). Hence, according to Turel et al (2007) in their research in Bornova district in Turkey, safety is one of the major problems in public space that elderly group identified.

b) Variation according to gender

In this survey, there was no significant different in terms of variations of perception between attributes that contribute to safe and security with gender. It was revealed the female group perceived a bit more in terms of the importance of 'presence of police surveillance', 'safe environments for elderly, disabled and children' and 'low crime statistics' that contribute to the safety and security street compared to male group. Meanwhile, for the male group of users they perceived a bit more on 'free of accidents' attribute compared to female group. The finding is a bit contrast with previous studies such as Loukaitou-Sideris (1995) who stressed that women are more concern in terms of safety compared to men.

	Male	Female	Mean Value
Presence of police surveillance	1.22	1.20	1.21
Free of accidents	1.38	1.41	1.41
Low crime statistics	1.38	1.31	1.35
Safe environments for elderly, disabled and children	1.43	1.41	1.42
Free presence of anti-social behaviour	1.41	1.41	1.41
Mean Value Response format 1= strongly important 4= strongly unimportant			

Table 7.11: Degree of safety and security attributes based on mean values, which shows a significant difference according to gender

Source: Field survey 2009

c) Variation according to ethnicity

Based on the chi-square test, there is no significant different in terms of variations of perceptions concerning safety and security attributes and ethnicity. However, the result shows slight variations between ethnicity groups with the perception of most important attributes that contribute to safety and security. Based on the mean value (table 7.12) between three ethnicity groups, the Malay group shows a more positive response concerning the attributes of safety and security that contributes to safety and security of the street. The result also found that between three ethnicity groups, the Indian group shows a more positive responds to the 'presence of police surveillance' as the most important attributes that make the feel safe to use the street compared to other two groups (mean value: 1.15). However, for other attributes the Malay users perceived a bit more than other groups. As for Chinese users, they perceive the importance of safety and security less than the other groups especially for 'free of accidents' and 'free presence of anti-social behaviour' attributes. The findings are parallel with Rapoport (1987) and Lawson (2001) that different cultural group needs in the use of the street.

	Malay	Chinese	Indian
Presence of police surveillance	1.22	1.23	1.15
Free of accidents	1.27	1.51	1.39
Low crime statistics	1.32	1.35	1.46
Safe crossing devices	1.34	1.49	1.44
Safe environments for elderly, disabled and children	1.40	1.48	1.41
Free presence of anti-social behaviour	1.35	1.54	1.49
Mean Value Response format 1= strongly important 4= strongly unimportant	1.32	1.43	1.37

Table 7.12: Degree of safety and security attributes based on mean values, which shows a significant difference according ethnicity

Source: Field survey 2009

d) Level of education group

There is a significant difference between the attributes of safe crossing devices and free of accidents with the education level groups (table 7.13). However, based on the strength correlations (Spearman rho test) for these attributes that show a significant difference, only the free of accidents attribute shows a significant correlation with weak correlation strength; the safe crossing devices shows a very weak strength of correlation (table 7.13)

Variables	Safe crossing devices	Free of accident
Education	χ^2= 24.135, df=8, p= 0.002	χ^2= 16.476, df=8, p= 0.036
	r= -.072,p = .182	**r= -.154**, p= .004

Table 7:13: Chi square test results and Spearman rho test on safety and security attributes according to demographic factors.

Source: Authors (2009)

	No academic qualification	Primary education	Secondary education	College or institution	University education
Safe crossing devices	1.00	1.11	1.43	1.47	1.27
Free of accidents	1.50	1.44	1.38	1.39	1.20
Mean Value Response format 1= strongly important 4= strongly unimportant					

Table 7.14: Degree of safety and security attributes based on mean values, which shows a significant difference with the education level of the group

e) Distance from residence

The distance from the residence shows a significant difference in their perceptions with the importance of crossing devices and activities day and night, with a significant correlation at the 0.01 level (Table 7.15). This shows that the strength of correlation of a significant difference is weak.

	Less than 1 km	1-5 km	6-10 km	11-15km	16-20km	More than 20 km
Safe crossing devices	2.00	1.55	1.48	1.24	1.13	1.25
Activities day and night	2.00	1.83	1.88	1.82	2.50	2.25
Mean Value Response format 1= strongly important 4= strongly unimportant						

Table 7.15: Degree of safety and security attributes based on mean values that shows a significant difference with distance from residence

Variables	Safe crossing devices	Activities day and night
Distance from residence	χ^2= 21.416, df= 00, p= 0.018	χ^2= 33.740, df= 15, p= 0.004
	r= -.259, p= 0.001**	**r= .252**, p = 0.001**

Table 7:16: Chi square test results and Spearman rho test on safety and security attributes with distance from residence.

f) Occupation

There is also a significant difference between the occupation group with activities day and night and low crime statistics. However the strength of the correlations based on the Spearman rho shows that the correlations are very weak. Regarding their perception concerning safety, the education groups secondary and above felt unsafe using the street alone but the other groups felt safe.

Variables	Activities day and night	Low crime statistic
Occupation	χ^2= 26.823, df=12, p= 0.008	χ^2= 35.053, df=4, p= 0.000
	r= -.058, p=. 450	r=- .060, p = 432

Table 7:17: Chi square test results and Spearman rho test on safety and security attributes according to occupation group.

Source: Authors (2009)

The users who work with the government or are self-employed showed the most positive response towards the low crime statistics attribute. In JTAR these were the groups that mostly used the street being either daily users or the occasional users. Even though the results of the chi square test show a significant difference for this attribute the results of the mean value only show a slight difference (7.18).

	Unemployed	Self employed	Private	Government	Others
Low crime statistics	1.29	1.21	1.29	1.18	1.20
Activities day and night	2.23	1.71	1.93	1.91	2.40
Mean Value Response format 1= strongly important 4= strongly unimportant					

Table 7.18: Degree of safety and security attributes based on mean values, which shows a significant difference according to occupation

Source: Field survey 2009

7.1.2 Comfort and convenience

Attributes and characteristics of comfort and convenience that contribute to user-friendly urban-commercial street

Comfort and convenience are the basic physiological needs for people. The results indicate similar patterns of importance in respect of the attributes of comfort and convenience that can attract more users to the street. Based on the users' perceptions concerning their level of comfort and convenience attributes, it shows that being free of pollution, noise, smell and vibration, lots of covered ways and shade that can protect them from the sun and rain, availability of dust bins, public telephones and others public facilities, breezy environment and suitable temperature are the most important criteria that make a street comfortable and convenient (Table 7.19).

The scale of the attributes shows the criteria of comfort and convenience that are important to the respondents. It was found that most of the attributes that were stated as most crucial according to users' perception are more related to the weather and climate of the street. Surprisingly, based on the mean value, seating placement, sufficient and comfortable seating is the least important criteria compared to the others. Comfortable streets are calm, welcoming and pedestrian friendly with the necessary facilities and services (Burton, 2006). Convenience is a basic physiological need for people.

The result of Table 7.6 show that the occasional users group expressed the importance of comfort and convenience attributes more than the other two groups (Occasional: 1.42; Daily: 2.02; Non User: 2.01). This indicates that the occasional group of users were more concerned with these attributes to make them use the street. However, based on the survey (table 7.6), it indicates that the attributes related to comfortable and sufficient seating and location of the seating are less important compared to other attributes according to the respondents' perceptions. These results give a different scenario compared to other studies in Western and European countries where seating in the street is an important attribute for their users (Whyte, 1980; Gehl, 1986; Carr et al, 1996 and Burton et al, 2006). The factors that relate to culture and climate may create different functions for the street and at the same time create different kinds of activities on the street, which contributes to different attributes of users' preferences and needs. However, from a comparison of the three groups of users, the daily group shows a more positive response than the others.

	Comfort and Convenience qualities	Occasional	Daily	Non user	Mean Value
a	**Free of pollution, noise, smell and vibration**	**1.18**	**1.25**	**1.28**	**1.23**
b	**A lot of covered ways/shade and other protection from sun and rain**	**1.38**	**1.34**	**1.37**	**1.36**
c	**Availability of dust bins, telephones and toilets**	**1.48**	**1.41**	**1.61**	**1.47**
d	**Breezy**	**1.45**	**1.54**	**1.51**	**1.50**
e	**Suitable temperature**	**1.43**	**1.56**	**1.46**	**1.50**
f	Very clear direction of the place	1.62	1.49	1.77	1.58
g	Very clear pedestrian signage	1.66	1.52	1.84	1.62
h	A lot of recreational facilities	1.66	1.57	1.79	1.64
i	Lot of banking and communications centres	1.69	1.59	1.81	1.66
j	Lots of convenient places for shopping	1.66	1.64	1.95	1.70
k	A lot of greenery (trees/shrubs/flowers and grass)	1.80	1.69	1.84	1.75
l	Very attractive building facades	1.76	1.70	1.91	1.76
m	A lot of outdoor cafes, refreshment kiosks	1.85	1.64	1.96	1.77
n	Lot of rest areas and seating places	1.95	1.67	2.14	1.85
	Width of the walking space	2.0	1.7	2.12	1.87
o	A lot of spots for entertainment	1.85	1.98	1.91	1.92
p	Comfortable and sufficient seating	2.07	1.74	2.16	1.92
q	Seating places adjacent to pedestrian flow	2.09	1.85	2.32	2.01
	Mean Value	1.42	2.02	2.01	1.53
	Response format 1= strongly important 4= strongly unimportant				

Table 7.19: Degree of comfort and convenience attributes based on mean values

Source: Field survey 2009

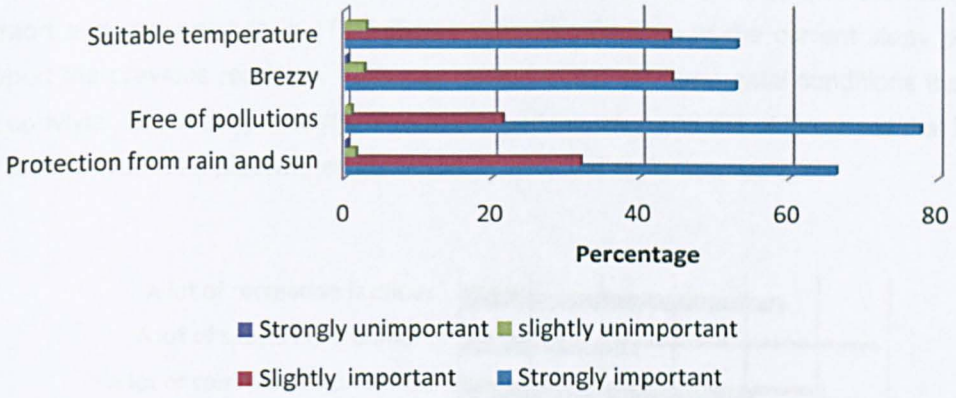


Figure 7.8: Users perceptions concerning the importance of comfort attribute
Source: Field survey 2009

The results also indicated that 'free of pollution, noise, smell and vibration' is the most important attributes that contributes to the comfort and convenience street by age, gender and ethnicity group of users. Based on mean value (table 7. 20) of the importance of attributes, the result shows no variation perceived by these three groups of user (scale: 1.42).

	Comfort and Convenience qualities	Age	Gender	Ethnicity	Mean Value
a	Free of pollution, noise, smell and vibration	1.23	1.23	1.23	1.23
b	A lot of covered ways/shade and other protection from sun and rain	1.36	1.36	1.36	1.36
c	Availability of dust bins, telephones and toilets	1.47	1.48	1.48	1.48
d	Breezy	1.50	1.50	1.50	1.50
e	Suitable temperature	1.50	1.50	1.50	1.50
	Mean Value	1.41	1.42	1.42	1.42
	Response format 1= strongly important 4= strongly unimportant				

Table 7.20: Degree of comfort and convenience attributes based on mean values
Source: Field survey 2009

Between the four attributes that contribute to the feeling of comfort on the street, free of pollution from dust, sound and smell is the attribute that most of the users indicated as being strongly important in the survey (figure 7.8). The results show that comfortable and sufficient seating and seating placed adjacent to the pedestrian flow were the least

important based on users' perceptions of the attributes that contribute to the feeling of comfort and convenience in JTAR (figure 7.9). The findings of the current study do not support the previous research. This may relates to the environmental conditions that are not convivial, not healthy in terms of pollution and the microclimate of the street that is too hot and humid, not a pleasing environment to view and lacks shaded area.

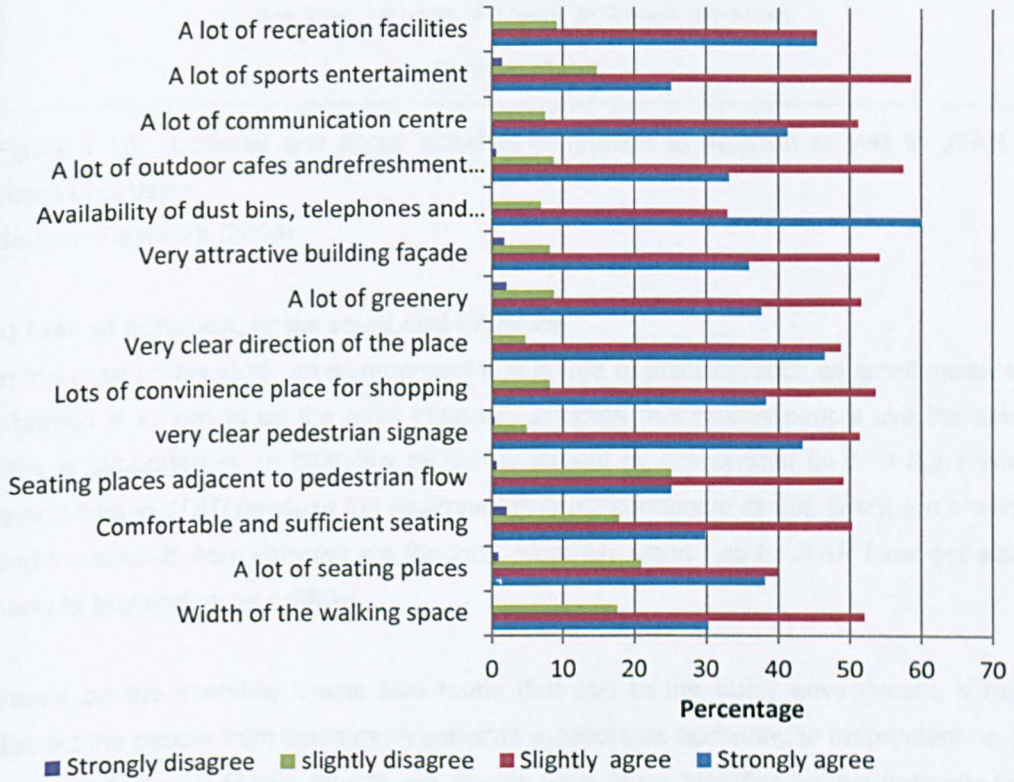


Figure 7.9: Users perceptions on the degree of the importance of convenience attributes that make them use the street

Source: Field survey 2009

The feeling of comfort and convenience affects the length of time people spend in a public space. This was supported by Carmona et al (2003) who stressed that comfort is a prerequisite of a successful public space and affect the length of time people stay in the space. Based on the feedback concerning the duration of visit, most of the users spend around 1-4 hours in this place during their visit (53.4 %) followed by 5-8 hours (29.3%) more than 12 hours (11.2%) less than 1 hour (3.4%) and 9-12 hours (2.6 %). The majority of the occasional respondents who used the street for 1-4 hours were the group that have optional and social activities, such as visiting, meeting friends, relaxing and entertaining (Figure 7.10).

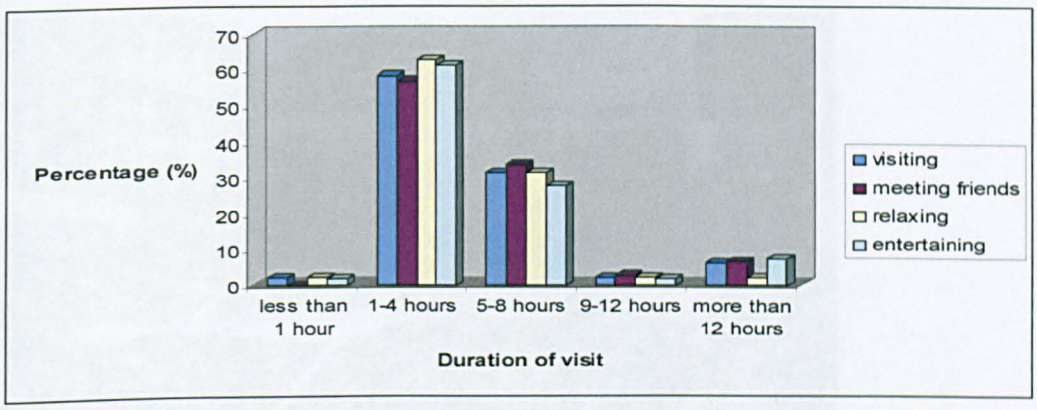


Figure 7.10: Optional and social activities in relation to duration of visit to JTAR by occasional users.
Source: Fieldwork (2009)

a) Free of pollution, noise smell and vibration

In the case of this study an environment that is free of pollution such as smell, noise and vibration is shown to be the most important attribute that makes people use the street. This is supported in an interview by the statement by respondent no.8: *"I don't like to spend time in JTAR because the environment is not conducive its hot, dusty, too crowded and the sounds from vehicles are too loud. Normally when I go to JTAR I just get what I need to buy and move." (Male)*

Based on the interview it was also found that due to the dusty environment, it might distract the people from doing more activities outdoors as according to respondent no. 2: *"When I go to JTAR with friends, we always have lunch together but we normally have lunch indoors (inside the building), because the outdoor environment is quite dusty that makes us uncomfortable" (Female).*

However, some of these elements also lead to physical discomfort. According to Krupart (1985), this attribute relates to the stress and experience of the environment. The results based on the survey of users' mode of transportation shows that the majority of the users (39.3%) used private cars and motorcycles (14.4%), which contributes to the air , noise and smell pollution on the street (Chapter 6, table 6.8). Based on the observation on site, it was proven that such pollutions are mainly caused by the number of cars on the street (Figure 7. 11).

Figure 7.11: JTAR with high density of cars on street

Source: Case study (2008)

This was supported by the fact from the Kuala Lumpur City Plan 2020 (2006) that in 2000 to 2003, 81% of the pollution was because of the vehicles. It was also proven from the statement from the Malaysian Automotive Association (2010) that the total number of registered vehicles in Malaysia has increased every year (Table 7. 21).

Year	1983	1990	2000	2009
Total number of registered vehicles for Malaysia	148,000	165,861	343,173	536,905

Table 7.21: Number of registered vehicles by year

Source: National Urbanisation Policy (2006) and Malaysia Automotive Association, 2010

This also supported by Krupart (1985), who stressed that these attributes are major stressful elements that people encounter daily in the city area. CABE and BBC Radio 4 in UK have come out with a nomination for UK best and worst streets in 2002 (Carmona et al., 2008). Out of the thousands of streets that were nominated, they chose the five best street and five worst streets. One of the qualities that make the street the best street chosen by users is because the street is clean and well maintained and one of the qualities that make the street the worst was because the street is dirty and poorly maintained (Carmona et al., 2008).

b) A lot of covered ways/shade and other protection from sun and rain

In hot and humid countries, protection from the sun and rain are important to create conducive outdoor environment. It is proven from the results that the presence of covered ways that provide shade and shelter from the sun and rain are important for people to use the street comfortably (Table 7.5). This is also supported by the results from the survey, which show that most of the users use the street in the morning and late afternoon. Figure 7.12 shows that people who use the street during late afternoon spend up to 4 hours in JTAR. Based on the observations on site, it is proven that most of the activities occurred in the areas that have shade and protection from the sun (figure 6.13). People use these areas to sit and do more static activities, as they feel comfortable compare to the unsheltered areas where only dynamic activities were witnessed. It is also proven that during hot sunny days in JTAR, people prefer to walk under covered walkways such as the corridors of the shophouses and under shade from buildings along the street and only seating in areas that have shade were being used (Figure 7.14).

Based on the literature reviews, there are three main ways of protection from the hot sunlight and protection for rain, the design, orientation and spacing of the buildings (Carmona et al, 2003 and Lang, 1994), trees planting and the spacing between tree and building, and the presence of covered walkways (Carmona et al, 2003). The orientation of buildings also plays an important role on the street to minimising the sunlight on the street. As proven by observation on site, the areas that are shaded by the buildings attract people and activities, especially optional and social activities (7.15). However, some areas of JTAR have good shadow casting because of the tall buildings in the street. Besides covered arcades, building overhangs of shopping complexes also provide shade for pedestrians.

In the case of JTAR, the pedestrian walkways are divided into two groups, which are covered walkways or arcades in front of the shops and uncovered walkways along the street. The former type of walkway provides protection from the sun, rain and strong wind while the uncovered walkways offer more space to walk. However, the research by Abdul Latip (2011) also found that people preferred trees to than covered walkways due to the cooling effect they bring to the area.

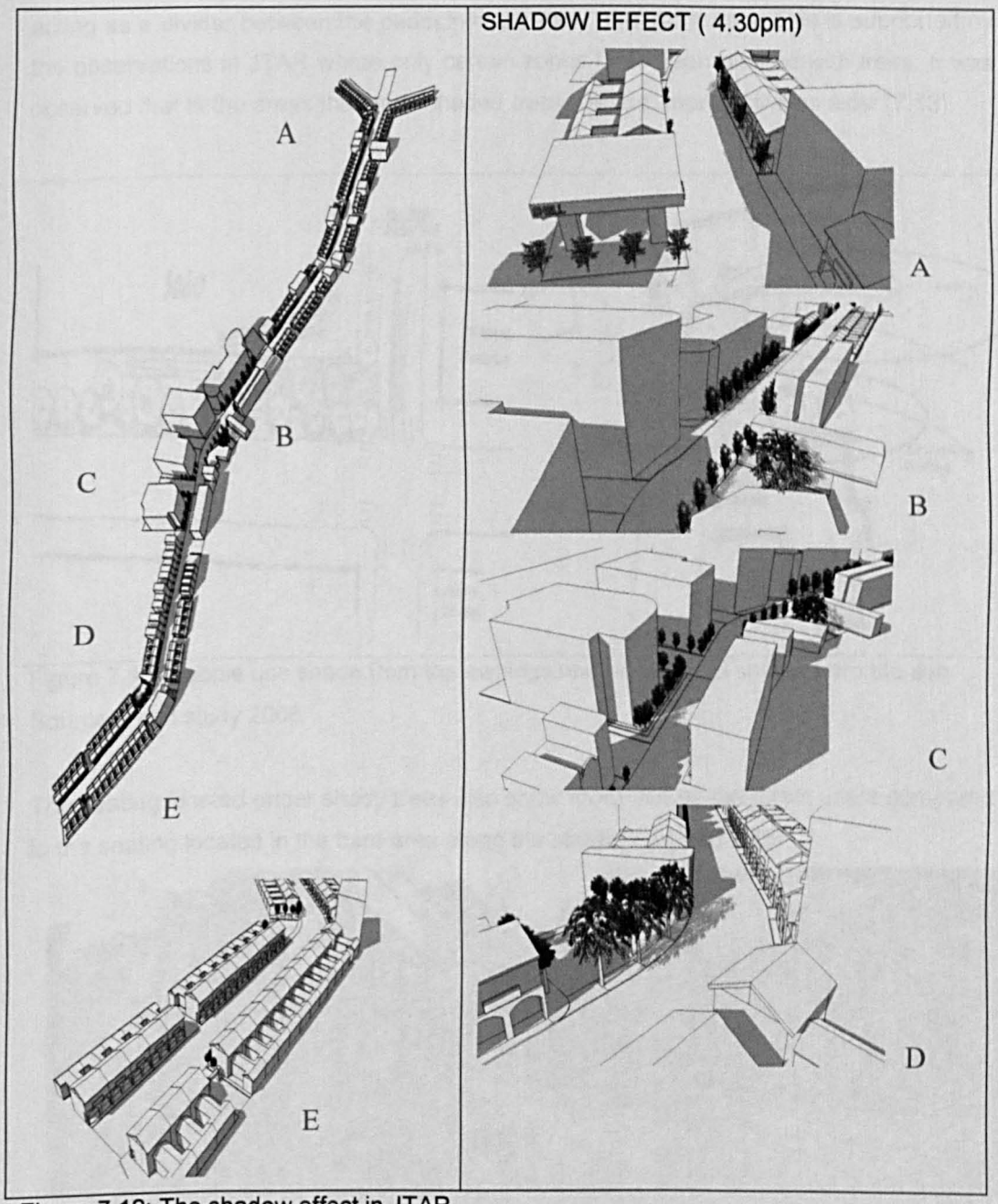


Figure 7.12: The shadow effect in JTAR

Source: Field study 2009

In chapter 6, it was found in survey of JTAR that, trees and greenery along the street do affect the uses of the street. In the case of JTAR, there is strong exposure to the sun every day, therefore tree planting is one of the provisions for providing shade, reducing glare and cooling the atmosphere (Jamil, 1996). It was also prove based on interviews that the presence of trees/ greenery was felt to have a positive effect on the environment, such as modifying the impact of the microclimate, providing shade from the sun and also

acting as a divider between the pedestrian walkway and traffic flow. This is supported by the observations in JTAR where only certain zones have been planted with trees. It was observed that in the areas that have shaded trees planted, more activities exist (7.13).

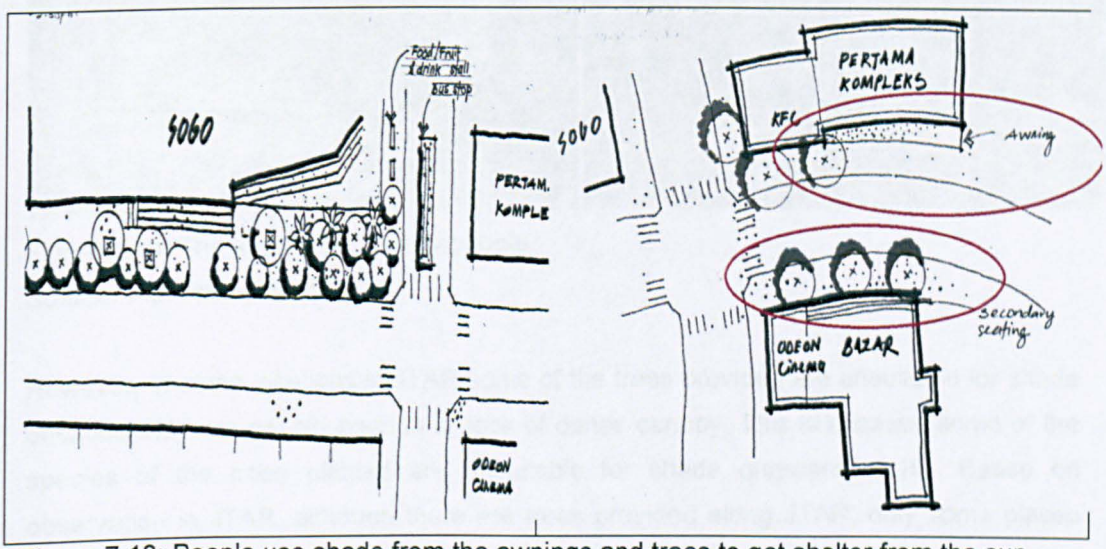


Figure 7.13: People use shade from the awnings and trees to get shelter from the sun

Source: Field study 2008

The seating located under shady trees also show more use by the street users compared to the seating located in the bare area along the street (7.14 and 7.15).

Figure 7.14: The static activities happening in the area that provide shade

Source: Field study 2008

Figure 7.15: The seating is used by people
Source: Field study 2008

However, in some locations in JTAR some of the trees provided are unsuitable for shade because they are not big enough or lack of dense canopy. This is because some of the species of the trees planted are unsuitable for shade purposes (7.16). Based on observation in JTAR, although there are trees provided along JTAR, only some places are shaded because in most parts the trees are not big and the canopies of the trees are not dense enough to provide shade for the pedestrians. In some part of the street palm trees have been planted which do not provide shade for pedestrians. This is one of the issues that need attention in the KL City Plan 2020, which is supposed to be gazetted in September 2011. The important of green areas was also supported in his research who found that, the feedback from respondents that need to be resolved and need attention is having more green areas in the city centre (Achariam, 2011).

Figure 7.16: Different size and density of tree canopy provide different level of shade
Source: Field survey (2008)

It has been proven in previous studies that relief from the sun is also a main factor that needs to be considered, as it can affect the microclimate in urban spaces (Whyte, 1981; Carr et al, 1992). Unlike Western and European countries where the sunlight penetration into places helps make the area more pleasant to the users (Carmona et al., 2003), in the Malaysian context the protection from sunlight is a crucial element that can make people feel comfortable and pleasant when using the street. The results from the survey concerning the improvements needed in JTAR reveal that providing covered walkway, trees and greenery which relate to protection from the sun and rain and also cooling aspect are required (Figure 6.17, Chapter 6). This is in line with the statement by Lynch (1981) that streets that are shady provide a setting for activities and can bring people together.

c) Breezy and suitable temperature

Based on the results from the survey it shows that breezy environment and suitable temperature of the space are among the most important attributes from the users perceptions that make them use the street and at the same time will contribute to a user-friendly street (Table 7.5). This is supported by Nikolopoulou et al. (2007) in their observation that there is a strong relationship between microclimate conditions and the use of space. They also found that based on their observations of the use of space air temperature and wind speed are among the vital parameters in the use of space.

The local climate of the site also relates to the existence of trees and greenery along the street. This is supported by the results from the survey in which one of the elements that needed improving in JTAR according to the respondents is increasing the greenery and tree planting along the street (Figure 6.17). The presence of greenery in the city not only provides shade but also may contribute to the cooling temperature in a place (Gill et al., in Abdul Latip (2011)). Therefore, planting and increasing greenery along the street may help to reduce the local temperature and at the same time will create a comfortable environment for the users to use the street. It has also been proved by Gill et al. in Abdul Latip (2011) that the mature trees can provide a cooler surface by 15.6 Celsius. The finding was also supported by Simonds (1994) who stressed that instead of for beautification, the presence of trees, ground covers and open water into the open space will reduce 30 degrees cooler to the surface temperature than that of sun hot paving.

Another criterion that affects the temperature in the street is physical structures which including the surface material. It was observed that some of the physical structures and surface material are not suitable for hot and humid country like Malaysia. This is

supported by (Mofidi et al, 2009; Bourbia et al. 2009) who stressed that physical structure including properties of surfaces can affect the urban climate that gives comfort environments to the street. Hence it was observed that the most of area on street is covered by hard surfaces. According to Bourbia et al. (2009) in their study, they found that there are differences in temperature in the area that fully covered by hard surfaces with non-existence of vegetation with the area that covered with hard surfaces with existence of vegetation.

Breezy or wind environment effect on the comfort of the street users. According to Carmona et al (2003), in a very humid climate like Malaysia, the outdoor spaces may need to be designed to encourage a greater thorough flow of cooling air. This can be achieved by modifying the design decisions like the pattern of physical layout either natural or artificial such as positioning access, trees planting, walls and other obstructions (Carmona et al., 2003). The importance of wind flow and air temperature in urban spaces to encourage people to use the space has also been stressed by other authors (Lang, 1994; Carmona et al., 2003; Jacobs, 1996 and Nikolopoulou et al., 2007).

In a hot and humid country like Malaysia, a comfortable environment can attract more users to the street. Based on the users' activities on the street, the way they use the street, duration of stay, time of usage and where they preferred to spend their time can help to identify how important this factor is for them. This supports the result from the survey in which most of the users use the street in the morning and late afternoon (figure 7.17). The majority of the users use this street in the morning (46.2%), late afternoon (27.4%), evening (16.2%) and afternoon 10% (figure 7.17).

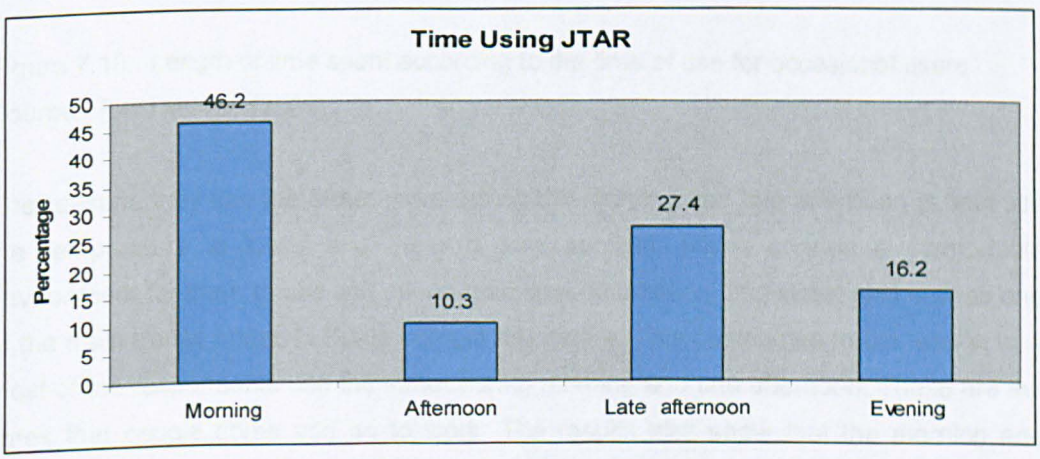


Figure 7.17: Time using the street by occasional users

Source: Field survey (2009)

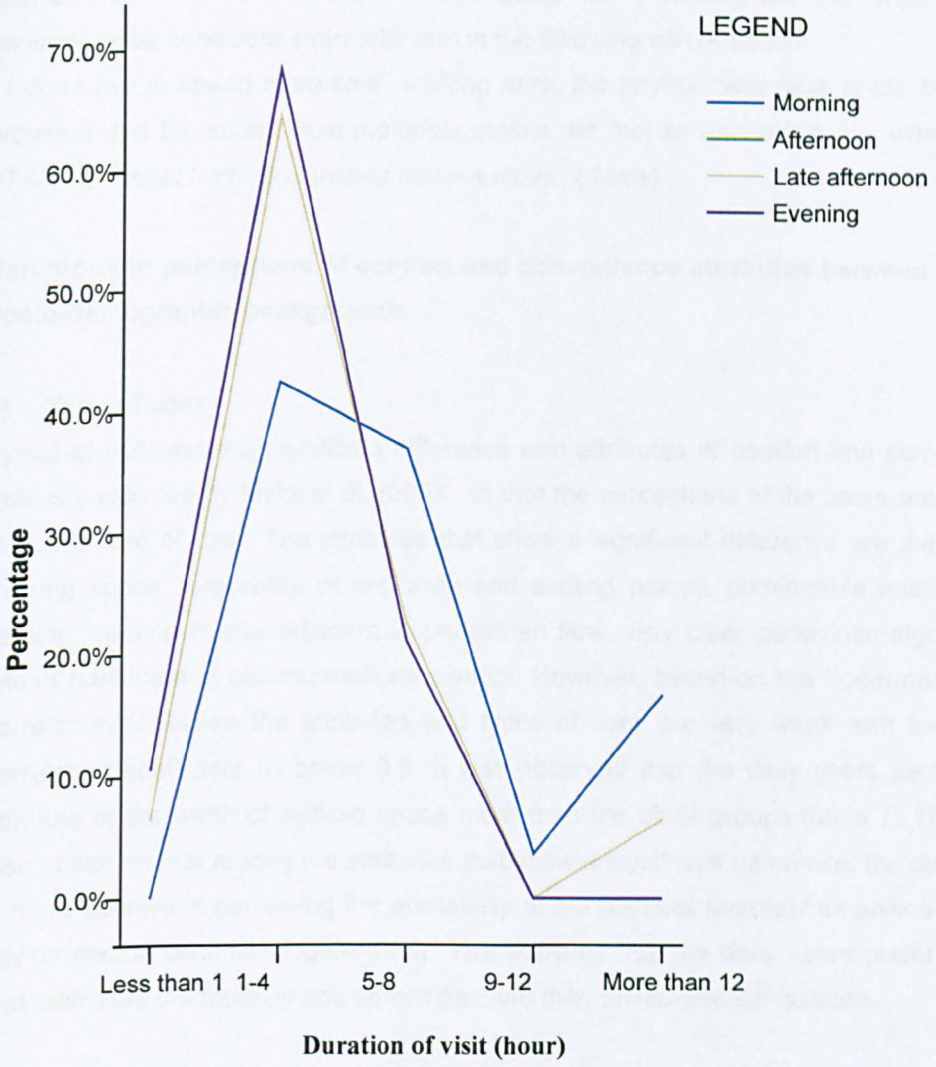


Figure 7.18: Length of time spent according to the time of use for occasional users
Source: Field survey (2009)

The reasons they use the street more during the morning and late afternoon is because the temperature is lower and there is less sunlight, which creates a comfortable environment for them to use and spend their time. In addition, this street also acts as one of the main transit nodes in Kuala Lumpur city centre. This contributes to the reason why most of the respondents use the street during morning and late afternoon. These are the times that people come and go to work. The results also show that the morning and evening users comprise the majority who spend from 1-4 and 5-8 hours in that street (Figure 7.18). The evidence from this indicates that people tend to stay longer if the environment is more comfortable. The more comfortable the environment the longer they

spend their time in that area. Respondents no 1 highlighted the importance of environmental conditions (microclimate) in the following conversation.

' I don't like to spend more time walking here, the environment here is too hot, dusty, crowded and the sound from motorists makes me feel so uncomfortable, when I go to JTAR I get what I want to buy and make a move.' (Male).

Variations in perceptions of comfort and convenience attributes between different socio-demographic backgrounds

a) Type of user

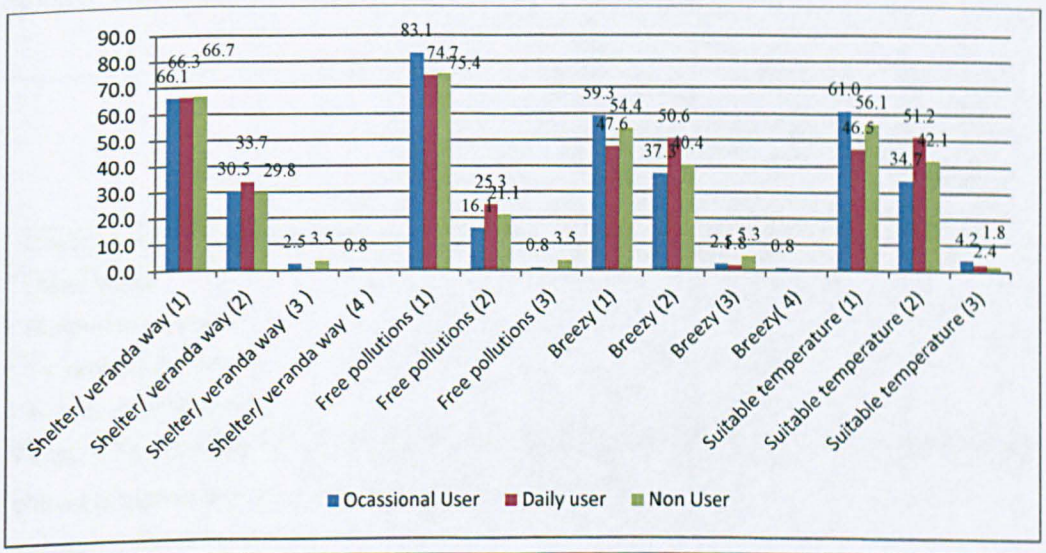
Types of user show a significant difference with attributes of comfort and convenience. This is supported by Melik et al. (2007), in that the perceptions of the users are different for each type of user. The attributes that show a significant difference are the width of walking space, availability of rest area and seating places, comfortable and sufficient seating, seating places adjacent to pedestrian flow, very clear pedestrian signage and lots of banking and communications centres. However, based on the Spearman rho the correlations between the attributes and types of user are very weak with the size of correlation coefficient (r) below 0.3. It was observed that the daily users perceive the attribute of the width of walking space more than the other groups (table 7. 17). It was also observed that among the attributes that show a significant difference, the daily group is more positive in perceiving the availability of the physical facilities/ amenities than the environmental condition (figure 7.25). This explains that the daily users prefer a street that facilitates the facilities and amenities more than environmental qualities.

Variables	Width of walking space	Availability of rest area and seating places	Comfortable and sufficient seating	Seating places that are adjacent to pedestrian flow	Very clear pedestrian signage
Type of user	χ^2= 27.681, df=4, p= 0.000	χ^2= 30.940, df= 6, p= 0.000	χ^2= 38.913, df= 6, p= 0.000	χ^2= 27.566, df= 6, p= 0.000	χ^2= 18.249, df= 6, p= 0.006
	r=- .031, p= .563	r= -.005 p=.932	r= -.048 p=.370	r= .028 p=.605	r= .033 p= . 544

Variables	Lots of convenient places for shopping	Very clear direction of the place	A lot of greenery	Attractive building facades	A lot of outdoor cafes and refreshment kiosks
Type of user	χ^2= 15.809, df=4, p= 0.003	χ^2= 13.634, df= 4, p= 0.009	χ^2= 13.016, df= 6, p= 0.043	χ^2= 20.053, df= 6, p= 0.003	χ^2= 21.586, df= 6, p= 0.001
	r= .102 p=.058	r= .025 p= .643	r= -.017 p= .759	r=.052 p=.337	r= -.014 p= .795
Variables	Lot of banking and communication centres				
Type of user	χ^2= 12.801, df=4, p= 0.012				
	r=.009, p=.874				

Table 7.22: Chi-square test and Spearman-rho test for comfort and convenience attributes according to type of user.

Source: Authors (2009)



Response format:

1= Strongly important, 2= slightly important,

3= slightly unimportant , 4= strongly unimportant

Figure 7.19: Degree of comfort attributes based on the most importance attributes

b) Age group

For comfort and convenience qualities, the age factor shows a significant difference in their perceptions of the importance of covered ways and protection from the rain and sun. Based on the strength of the correlation, the correlation is significant at the 0.01 level (weak). Between the five age groups the age group 18-25 are the users that show the most positive response to perceptions concerning the importance of covered ways and protection from the rain and sun that make them use the street. The age group of 46-60 are the group that considered this attribute the least important. This may reflect that these groups do not spend a long time in outdoor activities/ on the street compared to the former group. Based on observation, the former group are more related to outdoor static activities such as standing, chatting, observing others and sitting. Therefore, the need for a suitable environment that is comfortable and shady is important to them. This is supported from the results of the crosstab between age group (occasional users) and the time they use the street (JTAR) in which most of the users in the 18-25 age group used the street in the morning (40.7%) and evening (18.5%).

Variables	Test	Result
Age	Chi-square	χ^2= 27.685, df=12, p= 0.009
	Spearman rho	**r=.205**, p= .000****

Table 7.23: Chi-square test and Spearman rho test on the issue of protection from rain and sun

Source: Field Survey 2009

	Under 18	18- 25	26-45	46-60	Above 60
Covered way and protection from rain and sun	1.40	1.23	1.40	1.46	1.60
Mean Value Response format 1= strongly important 4= strongly unimportant					

Table 7.24: Degree of comfort and convenience attribute based on mean values, which shows a significant difference according to age group

Source: Field survey 2009

From the table 7.5, it can be seen that there are slight variations in terms of the attributes of comfort and convenience. All the five age groups perceived 'free of pollution, noise, smell and vibration', 'a lot of covered ways/shade and other protection from the sun and

rain', 'availability of dust bins, telephones and toilets', 'breezy' and 'suitable temperature' as main attributes that contribute to comfort and convenience of the street. However, the slight variation observed between the age group is that the attributes are least important by group under 18 years old and above 60 years old.

	Under 18	18- 25	26-45	46-60	Above 60	Mean Value
Free of pollution, noise, smell and vibration	1.30	1.20	1.24	1.25	1.20	1.23
A lot of covered ways/shade and other protection from the sun and rain	1.40	1.23	1.40	1.46	1.60	1.35
Availability of dust bins, telephones and toilets	2.00	1.75	1.71	1.84	1.70	1.76
Breezy	1.60	1.45	1.50	1.57	1.70	1.50
Suitable temperature	1.40	1.42	1.49	1.65	1.70	1.50
Mean Value Response format 1= strongly important 4= strongly unimportant						

Table 7.25: Degree of comfort and convenience attributes based on mean values, which shows a significant difference according to age group

Source: Field survey 2009

d) Variations according to ethnic background

The result of the Chi-square test shows no significant difference between the three ethnic groups. It was observed that all three groups indicated 'free of pollution, noise, smell and vibration' is the most important attributes that contribute to comfort and convenience of the street. However, it was observed that there was very little variation that existed between the three groups; the Malays, Chinese and Indians in their perceptions of the most important attributes that associated to the comfort and convenience of the street (table 7.27). The Malay group shows more positive response in terms of attributes that contribute to comfort and convenience compared to other two ethnic groups. In the case of 'a lot of covered ways, shade and other protection from the sun and rain' and 'availability of dustbins, telephones and toilets', there was a similarity between the Indian and Chinese groups.

	Malay	Chinese	Indian
Free of pollution, noise, smell and vibration	1.20	1.35	1.34
A lot of covered ways, shade and other protection from the sun and rain	1.30	1.44	1.44
Availability of dust bins, telephones and toilets	1.44	1.54	1.54
Breezy	1.47	1.57	1.51
Suitable temperature	1.47	1.54	1.54
Mean Value Response format 1= strongly important 4= strongly unimportant	1.38	1.49	1.47

Table 7.27: Degree of comfort and convenience attributes based on mean values, which shows a significant difference according ethnicity

Source: Field survey 2009

7.1.3 Accessibility and proximity

Attributes and characteristics of accessibility and proximity that contribute to user- friendly urban-commercial street

Results from the surveys on the issue of accessibility and proximity to the place indicated higher positive responses. The scales in mean value, as summarised in table 7.2, indicate that accessibility and proximity are important criteria to the street users in order to encourage them to use the street. Based on mean value, accessibility by foot, easy access by public transport and distance to destination from parking area show the most important criteria that can encourage users to use the street (table 7.28). The importance of proximity as one of the main factors that make people use the street was also discussed in Chapter 6. This is supported by Shamsuddin et al. (2010) in their statement that accessibility provides the users with travel choices and the absence of this quality may cause the increase of cars and other vehicular traffic on the street. Based on table 7.8, sufficient parking is the least important attribute according to the respondents, particularly for daily users as they always come to the street early and still have sufficient parking.

	Accessibility and proximity	Occasional	Daily	Non user	Mean Value
a	**Easy to get to by foot**	**1.43**	**1.49**	**1.39**	**1.45**
b	Easy access by public transport	1.55	1.49	1.49	1.51
c	Distance to area from the parking area	1.58	1.61	1.58	1.53
d	Meeting places for people from different cultures	1.66	1.55	1.67	1.56
e	No physical barrier, wall, building, fence, curb.	1.59	1.56	1.63	1.58
f	Well connected to paths of circulation or other places	1.58	1.62	1.49	1.58
g	Distance to area from public transport	1.58	1.67	1.63	1.60
g	Visibility of different activities	1.48	1.57	1.53	1.61
h	Sufficient parking	1.58	1.63	1.58	1.61
	Mean Value	1.56	1.58	1.55	1.56
	Response format 1= strongly important 4= strongly unimportant				

Table 7.28: Degree of accessibility and proximity attributes based on mean values

Source: Field survey 2009

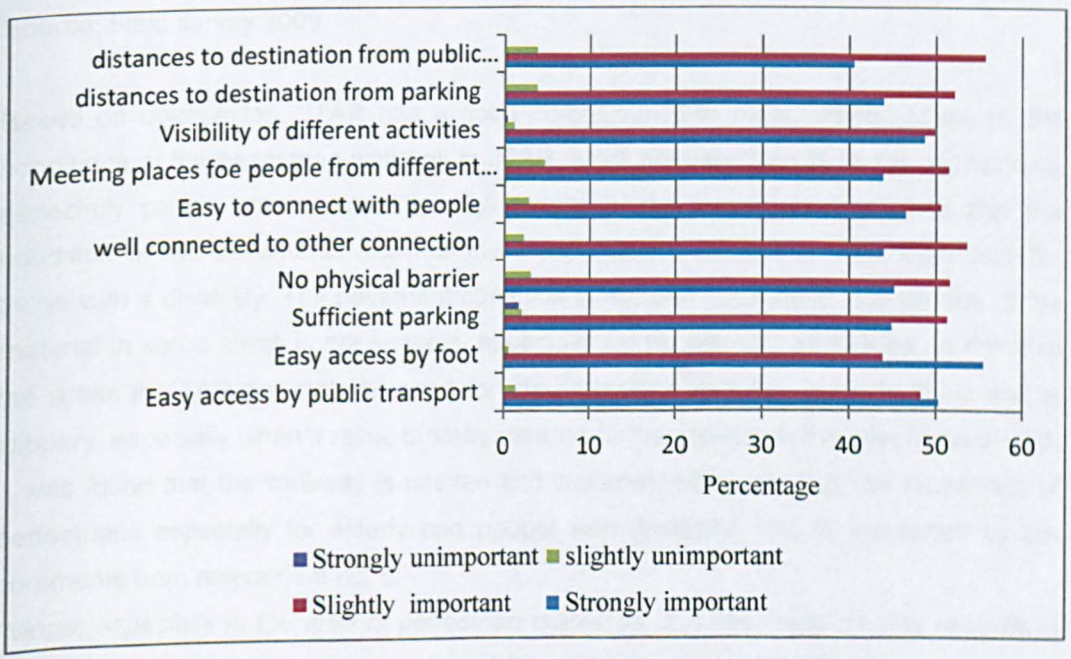


Figure 7.18: Degree of accessibility and proximity attributes based on mean values

Source: Field survey 2009

a) Easy to get to by foot

Easy to get by foot is based on several criteria and is a basic requirement for people (Lynch, 1981; Jacobs, 1996 and Carrs et al., 1992). It is dependent on the conditions of the walk way, well connected to path, services and facilities, wide, flat footways and no clutter blocking pedestrian movement. Easy to get by foot is related with safe environment to the pedestrian especially people with disability. The result from the survey under safety and security attributes indicated safe environment safe environment for elderly, people with disability and children as one of the main attributes that make people use the street (refer section 7.1.1 (d)).

The scale of attributes also proved that an easy to get by foot is the main attribute perceived by age, gender and ethnicity groups (Table 7.29).

	Accessibility and proximity	Age	Gender	Ethnicity	Mean Value
a	**Easy to get to by foot**	**1.45**	**1.46**	**1.46**	**1.46**
	Response format 1= strongly important 4= strongly unimportant				

Table 7.29: Degree of accessibility and proximity attributes based on mean values
Source: Field survey 2009

Based on observation, JTAR has a good connection with other streets, however, the conditions of the pedestrian walkway in JTAR is still not very friendly to the pedestrians, especially people with a disability. The results of the interviews mentioned that the condition of the pavements and material used made it difficult to walk, especially for those with a disability. The pavement condition is not well maintained, the surface of the material in some areas is not suitable, especially for people with disabilities. In some of the areas in JTAR the material used for the pedestrian walkway is not suitable and is slippery, especially when it rains, thereby causing further danger to the user (Figure 7.20). It was found that the walkway is uneven and cluttered, which obstruct the movement of pedestrians especially for elderly and people with disability. This is supported by the comments from respondent no. 5.

"Slope; especially in the area of pedestrian crossings, it is too steep. During rainy days the walkway is slippery may be the material used is not suitable." (Male).

Figure 7.19: Walkway conditions in JTAR that create unfriendly pedestrian movement
Source: Case study (2009)

It was found from observation that the walkways are lack of ramps at surface changes, and tactile areas that can help people with disabilities to use the street (Figure 7.18 and figure 7.19). Results from observation also show that the curb extension condition is too steep and inappropriate gratings have been used along the walkway that is not friendly to pedestrians, especially for people with disabilities (figure 7.20).

Figure 7.20: The steps and ramps
Source: Field study 2008

Figure 7.21: The walkway conditions and extension in JTAR
Source: Field study 2008

Observation shows that the street has not been designed to be friendly for pedestrian especially for people with disabilities. Most of the finishes used have not been carefully selected and arranged to ensure safety and unobstructed access for all. Furthermore, the location of signage, dustbins, phone booths and other street furniture along the pedestrian walkway create clutter for pedestrians to walk unimpeded. This is also supported by Tibbalds (2001) who commented that pedestrians are always being impeded by street furniture, such as lamp posts, dust bins, and advertisement boards while walking on the street, which makes the street inaccessible and unsafe for them to walk easily. This statement is supported by Carrs et al (1981) who state that the presence of these elements sometimes distract and cut the connections for walking routes and sometimes block the view where visibility is important for safety in the street.

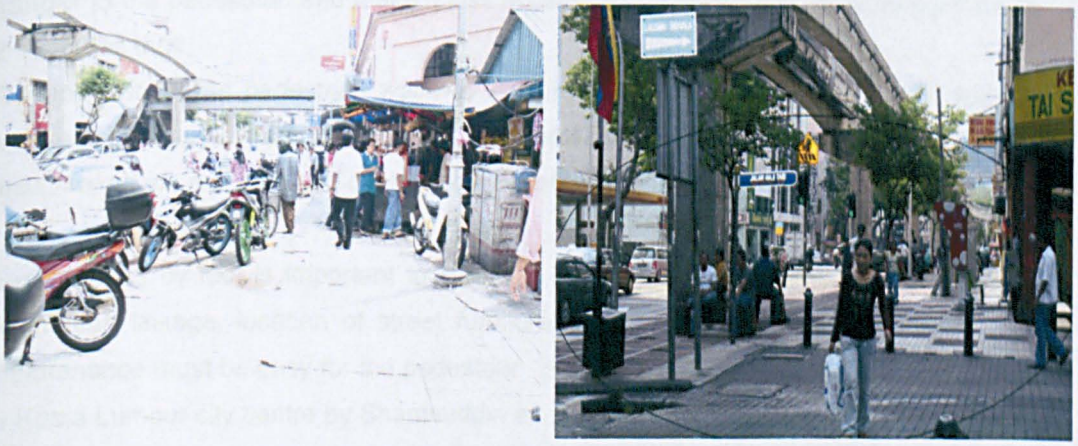


Figure 7.22: Conflict between pedestrians, clutter, motorcycles parking and traders on the street
Source: Field study 2008

In JTAR, the obstruction is not only cause by the location of street furniture along the street but also there are goods for sale and motorcycles parked illegally, which make it difficult to walk. There is also a conflict between pedestrians' access by foot with traders and stalls on the walkway and motorcycles that are illegally parked blocking the way for pedestrians (Figure 2.23). This not only affects the pedestrian movement by foot but also presents danger to the pedestrian from the traffic on the road.

Figure 7.23: The locations of dustbins and loading/ unloading activities that block the pedestrians' movement and present danger to the pedestrians through moving traffic
Source: Field study 2008

The width of the pedestrian walkway also affects the feeling of comfort in using the street. Based on observation some of the areas in JTAR have narrow sidewalks that may cause danger to the pedestrian and make it less accessible. The feedback from respondent no. 2 indicates that:

Respondent 2: 'the pedestrian walkway is too narrow and too many people make the walking environment feel unsafe. I feel different when walking in front of SOGO area; this area makes me feel safe and comfortable because the pedestrian area is wide.'

Easy access by foot is important to create a user-friendly street. Therefore continuous pedestrian linkage, location of street furniture, the design of pedestrian walkway and maintenance must be easy for the pedestrian. As proven by the previous study on streets in Kuala Lumpur city centre by Shamsuddin et al. (2010), people will walk longer and visit more shops if the street condition is convenient for them to walk. Continuous pedestrian linkage along the street is important, as per mention in Abdul Latip (2011) the obstacles as having to cross from one zone to another make it difficult and also can give danger to the pedestrian to walk or conduct activities. It has also been noted that easy to get to by foot, where there are shops and other facilities within walking distance, can attract more

people, and, at the same time, increase the activities on the street (Moughtin, 1992). Inaccessibility by foot also increases the number of cars on the street. This is supported by Schmitz et al. (2006) in their statement that currently people prefer to drive than walk even for short distance trips. Therefore, in the case of Malaysia, in order to make the street easy access for the entire pedestrian including the disabled people, the street design have to conform to the approved Standard and Industrial Research Institute of Malaysia (SIRIM), as Malaysian standard MS 1331: 1993: Code of Practice for Disabled People Outside Building.

Variations in perceptions of accessibility and proximity attributes between different socio-demographic backgrounds

a) Type of user

Based on the chi square test between the attributes of accessibility with the type of user no significant difference was shown. The results from the chi square test show that there are significant differences between the length of users engagement with the attributes easy to get to by foot, sufficient parking, well connected to path of circulation or other places, easy to connect with people, meeting places with people from different cultures. The strength of correlation is weak with the correlation significant at the 0.01 level. This significant difference may relate to the users familiarity with JTAR.

b) Age group

The age groups show a significant difference in their perception of easy to get to by foot, distance to area from the parking area and destination from public transport. The strength of correlation is significant at the 0.001 significance levels (table 7.30). These variations towards these kinds of attributes may relate to the user's ability to walk and proximity, which vary according to the different ages. The table shows that the users in the age group 18-25 mentioned easy access by public transport as being very important the most in their perceptions towards accessibility to JTAR. This may be because this is the group that mostly come to JTAR by public transport. This is supported by the results from the table, which indicate that the younger group is more concerned with the attributes that relate to the distance to destination from public transport rather than the older group. The age group of more than 45 years old usually come to this street by private cars more than public transport. This may because the public transport is not friendly to them or the street is not accessible by public transport or the location of public transport stations were is too far to their destination.

Variables	Easy access by public transport	Distances to areas from the parking area	Distance to destination from public transport
Age group	χ^2=26.560,df=8, p= .001	χ^2=19.934, df=8, p= .011	χ^2= 21.828df=8, p= .005
	r=.238, p= .000**	**r=.218**, p= .000**	**r=.209**, p= .000**

Table 7.30: Chi-square test result and Spearman rho test for accessibility

Source: Survey (2009)

	Under 18	18- 25	26-45	46-60	Above 60
Easy access by public transport	1.40	1.23	1.40	1.46	1.60
Distance to area from the parking area	1.50	1.49	1.44	1.43	1.30
Distance to destination from public transport	1.40	1.50	1.58	1.78	2.00
Mean Value Response format 1= strongly important 4= strongly unimportant					

Table 7.31: Degree of accessibility and proximity attributes based on mean values show a significant difference according to age group

Source: Field survey 2009

b) Gender

The result from Chi-square test shows no significant difference between gender groups of users in terms of attributes under accessibility and proximity. The two groups perceived an easy to get by foot as the most important attribute that contribute to a user-friendly street. The slight variation in perception between two gender groups was the female group shows more positive response towards that attribute (an easy to get by foot) as main attributes under accessibility that make them used the street compared to male group.

	Male	Female
Easy to get to by foot	1.48	1.43
Mean Value Response format 1= strongly important 4= strongly unimportant		

Table 7.32: Degree of accessibility and proximity attributes based on mean values show a significant difference according to gender

c) Ethnicity

The result from Chi-square test shows no significant difference between three ethnic groups of users in terms of attributes under accessibility and proximity. The slight variation in perception between three ethnic groups was the Chinese group shows more positive response towards that attribute (an easy to get by foot) as main attributes under accessibility that make them used the street compared to the other two ethnic groups (Table 7.33).

	Malay	Chinese	Indian
Easy to get to by foot	1.41	1.35	1.51
Response format 1= strongly important 4= strongly unimportant			

Table 7.33: Degree of accessibility and proximity attributes based on mean values show a significant difference according to ethnicity

c) Distance from residence

Distance from residence also shows a significant difference with the attributes easy to get to by foot, sufficient parking and distance from destination from public transport. Within these three attributes, easy to get to by foot shows significant correlations at the 0.001 level with very weak strength of correlation, while the other two attributes have no strength of correlation on the Spearman rho test (table 7.34).

Variables	Easy access by public transport	Sufficient parking	Distance to destination from public transport
Distance from residence	χ^2= 28.717 , df=10, p= .001	χ^2= 23.609, df=10, p= .009	χ^2= 18.674, df=10, p= .045
	r=-.200****; p= .008**	r=-.022 , p= .775	r=.062 , p= .419

Table 7.34: Chi-square test result and Spearman rho test for accessibility

The results for the mean value comparison between distance from residence and the attributes that show a significant difference revealed that the users that stay less than 1 kilometre from JTAR did indicate that easy access by public transport and distance from destination from public transport were the most important attributes that make them use the street (Table 7.35). This may be because they are the group that use public transport

and use private cars less. This is supported by the result indicated in their perception concerning the attributes of sufficient parking where the group that stay less than 1 kilometre from the street said that this attribute was only slightly important to them.

	Less than 1 km	1-5 km	6-10 km	11-15km	16-20km	More than 20 km
Easy access by public transport	1.00	1.53	1.72	1.35	1.53	1.28
Sufficient parking	2.00	1.55	1.61	1.35	1.94	1.50
Distance to destination from public transport	1.00	1.55	1.59	1.41	1.94	1.60
Mean Value Response format 1= strongly important 4= strongly unimportant						

Table 7.35: Degree of accessibility attributes based on mean values, which shows a significant difference with distance from residence

d) Length of engagement

Length of engagement also shows many significant differences with the accessibility attributes (Table 7.36). The attributes that show a significant difference with length of engagement were easy access by public transport, sufficient parking, no physical barrier, easy to connect with people, meeting places for people from different culture, distance to destination from parking and distances from destination to public transport (table 7.36).

Variables	Easy access by public transport	Sufficient parking	No physical barrier	Easy to connect with people	Meeting places for people from different cultures	Distance to area from the parking area
Length of engagement	χ^2= 52.179 df=8, p= .000	χ^2= 29.556 df=12, p= .003	χ^2= 18.346 df=8, p= .019	χ^2= 34.380 df=8, p= .000	χ^2= 23.630 df=8, p= .003	χ^2= 18.975 df=8, p= .015
	r=.488 p= .000**	**r=.324** p= .000**	**r=.263** p= .001**	**r=.406** p= .000**	**r=.305** p= .000**	**r=.337** p= .000**

Variables	Distance to destination from public transport					
Length of engagement	X^2= 18.975 df=8, p= .015					
	r=.226 p= .003**					

Table 7.36: Chi-square test result and Spearman rho test for accessibility

Source: Survey (2009)

	Less than 1 year	1-5 years	6-10 years	11- 15 years	More than 15 years
Easy access by public transport	1.00	1.24	1.42	1.97	1.76
Sufficient parking	1.00	1.41	1.56	1.94	1.94
No physical barrier, wall building, fence and curb	1.00	1.43	1.50	1.65	1.85
Easy to connect with people	1.00	1.35	1.46	1.84	1.91
Meeting places for people from different cultures	2.00	1.38	1.42	1.77	1.85
Distances to destination from parking	1.00	1.42	1.67	1.84	1.85
Distances from destination to public transport	2.00	1.54	1.71	1.71	1.91
Mean Value Response format 1= strongly important 4= strongly unimportant					

Table 7.37: Degree of accessibility attributes based on mean values, which show a significant difference according to length of engagement

Source: Field survey 2009

e) Level of education

Surprisingly in this survey, the level of education shows a significant difference in their perceptions towards many of the attributes of accessibility, such as easy to get to by foot, sufficient parking, well connected to path of circulation or other places, distance to area from the parking area and distance to destination from public transport (Table 7.38). However, based on the strength correlations test, only distance to areas from the parking

area shows a significant correlation based on the Spearman rho test, the rest of the correlations are very weak.

Variables	Easy to get there by foot	Sufficient parking	Well connected to path of circulation or other places	Visibility of different activities	Distance to area from the parking area	Distance to destination from public transport
Level of education	χ^2= 25.421 df=8, p= .001	χ^2= 36.712 df=12, p= .000	χ^2= 20.572 df=8, p= .008	χ^2= 28.536 df=12, p= .005	χ^2= 16.962 df=8, p= .031	χ^2= 27.119 df=8, p= .001
	r=.047 p= .348	r=-.041 p= .453	r=-.105 p= .053	**r=-.149** p= .006**	r=-.089 p= .100	**r=-.151** p= .005**

Table 7.38: Chi-square test result and Spearman rho test for accessibility

Source: Survey (2009)

The users under the group of university education show more positive responses to the importance of sufficient parking, well connected path to path circulation, distances to destination from parking area and distances from destination to public transport compared to the other groups of education level (7.39).

	No academic qualification	Primary Education	Secondary Education	College or Institution	University Education
Easy to get there by foot	1.75	1.44	1.44	1.40	1.53
Sufficient parking	1.75	1.56	1.55	1.76	1.46
Well-connected of path to path circulation or other places	1.75	2.00	1.67	1.58	1.51
Visibility of different activities	1.00	1.67	1.65	1.50	1.45
Distances to destination from parking area	1.75	1.78	1.57	1.71	1.46
Distances from destination to public transport	1.50	1.78	1.65	1.75	1.43
Mean Value Response format 1= strongly important 4= strongly unimportant					

Table 7.39: Degree of accessibility attributes based on mean values, which show a significant difference with level of education

Source: Field survey 2009

f) Marital status

Marital status shows a significant difference with the attribute 'distance to destination from public transport' with correlation of significance at the 0.001 level (Table 7.40). Other attributes of accessible did not show any variations based on the chi square test with marital status.

Variables	Distance to destination from public transport
Marital status	χ^2= 7.921, df=2, p= .019
	r=.161 **p= .034

Table 7.40: Chi-square test result and the Spearman rho test for accessibility

Source: Survey (2009)

Based on the mean value test on this attribute it shows that the single group of users show a more positive response concerning the importance of the distance to destination from public transport compared to the married user group (Table 7.41). This may reflect that the single group are the users that mostly come to JTAR by public transport and the married group normally use the street with family and come to the street by private car. This is proven by the results from the survey in which the majority of the married users come to JTAR by private car (51.3%), refer to table 7.42. From the results of observation, the groups that love to spend time and walk from one shop to another are mostly the single group, whereas for the married group they are more specific in their reason for going there. Therefore, they much prefer to use private cars and park nearby the place they want to go rather than walking and using public transport.

	Single	Married
Distance to destination from public transport	1.54	1.70
Mean Value Response format 1= strongly important 4= strongly unimportant		

Table 7.41: Degree of accessibility attributes based on mean values, which show a significant difference according to distance from residence

Source: Field survey 2009

	Car	Bus	Taxi	Commuter	Motorcycle
Single	33.3%	6.4%	2.6%	41.0%	16.7
Married	51.3%	10.3%	0.0%	28.2%	10.2

Table 7.42: Marital status and how they go to JTAR

Source: Field Survey 2009

7.3 Conclusion

The purpose of this chapter is to examine the attributes and characteristics of the street environment from the physical and functional qualities that strongly relate and influence the friendly street to the users. This is also done to determine the similarities and differences in the perceptions of attributes associated with a user-friendly street. The variations in perception between different types of user and socio-demographic background were analysed to establish if these factors had any influence on the perception of a user-friendly urban commercial street in Kuala Lumpur city centre.

In this research, the attributes associated with safety and security play the most significant role in supporting the user-friendly street in the study, followed by comfort and convenience and accessibility. Under safety and security aspects, the presence of police surveillance, free of accidents and low crime statistics, safe crossing devices, safe environment for elderly, disabled and children, and free of the presence of anti-social behaviour are the attributes that are most important based on users perceptions that contribute to a user-friendly street. The findings show that in Malaysia, the users still rely on the presence of police and safety officers to make them feel safe, which also reflects that streets in Malaysia still not safe for their users.

Under comfort and convenience attributes: free of pollution, noise, smell and vibration, a lot of covered ways/shade and other protection from sun and rain, availability of dustbins, telephones and toilets , breezy and suitable temperature, are considered important attributes. It was discovered that the attributes of accessibility are the least important attributes compared to the safety and security, and comfort and convenience attributes. Easy access by foot is the most important attribute for users. This explains that safety and security attributes are the users' preferences and needs that most made the street friendly to them. It was also discovered that some of the attributes that are important in urban space in previous theory and research were not so important attributes for the users in Malaysia. Things such as the and location of seating were important attributes in Western and European countries but not so important in the context of a commercial street in Malaysia compared to other attributes that involve the environment conditions, such as pollution, protection from the sun (shade and suitable temperature and breezy environment). This also shows that in a hot humid country like Malaysia, the issues relating to microclimate and psychological comfort are important.

In variations of perceptions of attributes towards user-friendly street between different types of users, the occasional groups are the group that perceive the qualities of the street more positively. The occasional and non-user group show similar perceptions towards the most important attributes that contribute to the safety and security environment which are the presence of security and police officials and low crime statistics. The attributes that shows significant different between type of users and attributes under safety and security qualities are types of activities, activities day and night, free of accidents, low crime statistics and no graffiti and vandalism.

Under variations of perceptions of comfort and convenience quality, the occasional group shows more concerns with the attributes compared to other groups. The attribute that most important contribute to comfort and convenience perceive by occasional group is free of pollution, noise, smell and vibration. The attributes of comfort and convenience that shows significant different between user groups are width of walking space , availability of rest area and seating places, comfort and convenience seating, seating places that are adjacent to pedestrian flow, very clear pedestrian signage, lots of convenience places for shopping, very clear direction of the place, a lot of greenery, attractive building facades, a lot of outdoor cafes and refreshment kiosks and lot of banking and communications centre. However, for the attributes of accessibility with the types of user no significant difference was shown.

In the finding of variations in perceptions under safety and security between different social-demographic backgrounds shows significant different between different age groups with the presence of people and activities on street, presence of activities day and night, safe crossing devices, free of accidents and low crime statistics. There were also variations in perceptions of 'distance from residence group' with safe and crossing devices and activities day and night. Under variation in perception comfort and convenience attributes with age groups. The only attribute that shows significant is 'the presence covered walkway and protection from rain and sun'.

In terms of variations in perceptions under accessibility attributes with different socio-demographic backgrounds. The findings show that there are variations between age groups with attributes such as easy access by public transport, distance to destinations from the parking areas and distance to destination from public transport. The variations also show between distance of residence with the attributes of accessibility such as easy access by public transport, sufficient parking and distance to destination from public transport. The variations was also found between 'length of engagement' group with the

attributes of easy access by public transport, sufficient parking, no physical barrier, distance to destination from parking areas and public transport, and easy to connect with people.

CHAPTER 8
CONCLUSION AND RECOMMENDATIONS

8.0 Introduction

This chapter presents the summary of the main findings of the thesis together with conclusions and recommendations of the research. This chapter is divided into four main sections. The first section restates the research agenda and the approaches taken. This is followed by a summary of the main research findings and the implications of the findings on planning and urban design in the context of Kuala Lumpur city centre. Limitations of the research are then acknowledged before the final section presents the recommendations for possible and further research in the area.

8.1 Research agenda

The aim of this research is to identify the factors and the elements that make urban commercial streets friendly to users in the context of Kuala Lumpur city centre. Therefore, the research seeks to establish the physical elements and environmental characteristics that influence peoples' use of such street; their preferences concerning and the street qualities and attributes that influence their decision whether or not to use the street. The qualities associated with user-friendly urban commercial streets were derived from the indicators used to describe the users' activities, and how they use the street; and the significant attributes identified by the respondents. The similarities and differences concerning how a variety of the users engage with the street and their perceptions of the elements and qualities associated with a friendly street were also investigated.

In this research, a user-friendly street, as defined by Tibbalds (1990) and Jacobs (1996), is related to the quality of the space that fulfils the needs of all the users. Thus, it was assumed that in this research, the qualities that fulfil the need of users become part of the qualities that are associated with a user-friendly urban commercial street. A comprehensive literature review in chapters two and three established the main issues that were relevant to this research. Based on the literature review, it was concluded that the qualities of a user-friendly urban commercial street comprise of three main components:

(i) the physical environment qualities;
(ii) the activities and functional qualities; and
(iii) the social qualities.

There are also variations in users' needs and behaviour on the street between different types of user and from different socio-demographic backgrounds. Based on previous research, there was no specific study on users' needs of streets generally and on urban commercial streets specifically in relation to user-friendly streets in a similar context. Most of the studies on users' needs were more on general urban spaces, particularly squares, parks and plazas in Western and European countries. Although some scholars emphasised the qualities of a friendly street, most of them focused more on the physical environment and behaviour rather than the current needs of the users in a specific context.

The case study chosen in this research is Jalan Tuanku Abdul Rahman, (JTAR), which is one of the main urban commercial streets in Kuala Lumpur city centre. The background and context of the case study was thoroughly explained in chapter five. Chapters six and seven presented the results of the survey and the analysis using the triangulation method. There are three main objectives and approaches taken to achieve the objectives of this research:

a) To identify the factors that make a street friendly to its users.

The factors that make a friendly street were evaluated based on the actual users' activities and needs from the street - what makes them use or not use the street and why? The results were cross-analysed with the data from observational studies (physical and functional) and also from user interviews to identify the factors that contribute to user-friendly urban commercial streets in both the physical and functional dimensions.

b) To examine the attributes and characteristics of the street that makes an urban commercial street friendly to its users.

The evaluation is based on the theory, preliminary investigation and previous research that mostly mention the attributes and characteristics that make a street friendly for its users. The attributes evaluated in this research are under the qualities of safety and security, comfort and convenience, and accessibility. Characteristics and attributes associated with these qualities were analysed to further understand how they contribute to the creation of a friendly street. The results from the survey are based on 4-point Likert-scale values. Finally, the results from the survey were cross-analysed with the results from physical and functional observational studies and the interviews.

c) To determine the similarities and differences of a friendly street to people from different socio-demographic backgrounds.

In identifying the variations of user-friendly street to users from different types of socio-demographic background, Chi-square tests were used to determine the significant relationships between variables with the attributes and characteristics in the survey. In order to look at the strength of the relationship, a Spearman Rho correlation test was used. The results revealed a significant relationship, which was later cross-analysed with the results from the interviews and observations.

8.2 Main Research Findings

The research adopted a mixed method approach and strategy in data collection and analysis. The data from multiple sources of evidence - questionnaire survey, interviews, physical observation and activities observation on the site - were collected, interpreted, analysed and triangulated to obtain reliable findings.

Based on the research, three main findings are identified in the analysis. The first concerns the factors that make people use the street. The second relates to the attributes of the street associated with a user-friendly urban commercial street. The third relates to variations in the needs and perceptions of factors and qualities of the street between different types of users from various socio-demographic backgrounds. The main findings of the research are as followed:

a) Factors that make an urban commercial street friendly to the users in terms of physical and functional dimension.

The findings suggested five key factors that make people use the street that can be associated with a user-friendly urban commercial street. The key factors that make the users either use or not use the street are: 'attractiveness'; 'activities'; 'congestion'; 'proximity'; and 'familiarity' with the street. This research highlights that in respect of an urban commercial street in Kuala Lumpur city centre, the users' needs tended to emphasise the importance of functional factors in comparison to physical factors. These functional factors of the street are related to satisfying the users' needs and supporting their desired activities on the street.

i) It was discovered in this research that the attraction of the street is one of the significant needs for street users that make them use the street. In the context of an urban commercial street, the main attraction for users tends to be either the opportunity for shopping activities or as a place to earn money. This emphasises the dominant role of JTAR as a shopping street as well as a

commercial area. It was suggested that another factor that attracts people to use the street is the physical environment, such as public spaces, greenery/trees and buildings. These findings support much of the literature (such as Gehl, 2000; Jacobs, 1996; Plowden, 2001; Ujang, 2008 and others), which highlight that qualities related to 'the feeling of relaxation', leisure and aesthetic value can also play an important role in attracting people to a street.

ii) The research also discovered that the activities of the street comprise another significant factor that makes people come to the street. Based on the findings, the main activities here were more in respect of necessary activities and activities relating to relaxation and leisure were less important than others activities for this street. This contradicts many of the findings from previous research from European and Western countries. The results may occur because of the constraints in terms of the microclimate impact on comfort due to a lack of shade from the sun and rain, and a culture that limits outdoor activities. This finding confirmed the theories by Gehl (2010) and Tibbalds (1992) who mentioned that there is a strong connection between the activities on the street with the qualities of the environment and the site context. This factor relates to meeting users' physiological needs and it is a prerequisite to attract users to a street. This concurs with Lang (1996) who stressed that activities, the qualities of the milieu and ambient condition are three major areas of concern in meeting human physiological needs,.

iii) This research determined that feeling of congestion on the street affects the level of friendliness to users. The findings highlight two factors that contribute to congestion in JTAR; pedestrian congestion and traffic congestion. People congestion was due to the high density of people and the movements (speed) of the people on the street. The finding in terms of people movements (speed) on the street is similar to those of Al-Azzami (2004) who stressed that in commercial streets, people tend to walk slower than during other trip purposes. The finding also highlights that another significant factor contributing to congestion in JTAR is traffic congestion. Traffic congestion in JTAR is mainly caused by the high use of private vehicles on the street, the width of the street and the nature of parking along the street. This traffic congestion and people congestion on the street makes the pedestrian users feel uncomfortable and unsafe and discourages them from using the street. Krupart (1985) had similar findings and stressed that congestion on streets contributes to the feeling of stress amongst street users. Interestingly, Ruggiero (2001) found that crowded streets can contribute to a sense of belonging and safety, however, if they become too congested people begin to feel uncomfortable and unsafe and therefore avoid using them.

iv) The research outcomes identified that the feeling of congestion varies amongst different types of user, in different cultures and in different contexts and therefore, evaluations have to take these into consideration. This finding confirms the theory by Whyte (1988) who noted that

the feeling of congestion is self-levelling, and that people have a different sense of the number that is right for a place and different perception to determine how many is too many for them.

v) The research findings also highlight that proximity/distance from origin to destination is another factor that affects a user's likelihood of using a street. Carney (2000) and Burton et al. (2006) developed similar conclusions and noted that this factor contributes particularly to the accessibility of the street. However, based on research by Al-Azzami (2004), in certain cases, people often have to avoid the shortest route due to physical obstacles and the presence of too many people on the street.

vi) Another finding of the research was that familiarity and length of engagement with the place affects the level of friendliness of a street to its users. In this research, the findings show that a strong sense of familiarity to the place is developed through constant engagement and long-term association. It was revealed that the daily users who are engaged with the street for a longer period also feel more comfortable and safer. Ujang (2008) also identified that familiarity can strengthen place attachment.

vii) The results of this research also indicate that there are five supportive factors that contribute to the use of the street: public space, greenery/trees, public amenities, maintenance and freedom of action. These are the supportive factors that contribute to the creation of a user-friendly urban commercial street. Although these are not necessarily the main factors that contribute to a user-friendly urban commercial street they do have an important role to play. These were the five most mentioned factors in the survey and were commonly suggested by respondents as improvements that were needed in the urban commercial street. Knox (2005) also stressed that increasing the qualities of the factors mentioned above is very important in creating ordinary places. This is also supported by ITE (2009) in their solutions to designing urban thoroughfares and they suggest that the presence of above factors in a commercial street can stimulate higher level of pedestrian activities.

b) Attributes and characteristics of the street that makes urban commercial street friendly to the users.

In this research, there are three main qualities identified that significantly contribute to a user-friendly urban commercial street. These qualities are safety and security; comfort and convenience; and accessibility. Under each quality, the most mentioned attributes were listed based on the literature review and previous research from various contexts of all over the world. Based on the findings of this research, in the context of an urban commercial street in Kuala

Lumpur, safety and security was the most important quality contributing to user-friendliness; followed by comfort and convenience, and accessibility.

This research highlights that the attributes evaluated for the qualities that contribute to a user-friendly urban commercial street in research of general types of urban spaces in the western and European countries, are also relevant to the Kuala Lumpur context. However, the evaluation criteria have to be adapted to suit the local context. These findings are confirmed by Moughtin (1992), Knox (2005) and Gehl (2008) who all mention that the main issue that leads to an unfriendly street environment in urban centres is a lack of understanding of the users' specific contextual needs.

i) Safety is the main concern for street users in Malaysia. Safety and security attributes that were identified as being the most important from respondents' perceptions were 'the presence of police surveillance', 'free of accidents and low crime statistics', 'safe crossing devices', 'safe environment for the elderly, disabled and children' and 'free of the presence of anti-social behaviour'. These finding concur with much of the literature (such as Burton, 2006 and Gehl, 2010), which not surprisingly stresses that safety is an important characteristic for street life and to attract people to use a street.

In Kuala Lumpur, the presence of police and security officers increases the use of the street. These finding shows that Malaysians street users are still depend on the presence of police and safety officials to feel safe when using an urban commercial street. Therefore, additional police posts, and an increase in the number of police and security officers along the street would increase the feeling of safety and security on the street and lead to an increase the use of the street. However, according to Jacobs (1961) the streets are not only primarily kept the police but kept primarily by the people who use the street. Jacobs (1961) suggested that in creating safe there must be eyes on the street who act as natural surveillance upon the street, the buildings along the street must be also oriented to the street and the street must continuously have users on it in order to increase the number of surveillances on the street.

The findings also suggest that familiarity with the place makes the users feel more secure and safe. These findings are similar to those of Ujang (2008) who mentioned that users who have been engaging with the place for a longer period felt an increased level of safety.

The street is still monopolized by cars and pedestrians are not prioritised, particularly those with mobility issues. Therefore, safe crossing devices are the facilities most needed in an urban commercial street like JTAR. The findings is confirmed by La Plante (2007) who mentioned that making pedestrian crossing safe, comfortable and more frequent is one of the important

elements in creating user-friendly street. The crossing devices currently provided are not sufficient and in some of the busiest areas a pedestrian crossing is not provided at all. Also, those crossing devices that are provided do not consider certain user groups such as those with hearing and sight problems. Furthermore, the bridge-type crossings provided in some areas along the street are not friendly to users with mobility issues. The earlier Shamsuddin et al. (2010) study of JTAR also noted these issues.

The findings also reveal that anti-social behaviour is a significant contributor to the feeling of safety and security in a street. This finding is supported by many authors (such as Whyte, 1980; Carr et al., 1992 and Tiesdell et al., 1998) that highlight the presence of anti-social behaviour in urban spaces negatively impacting upon the 'sense of safety'.

ii) In terms of comfort and convenience the users of JTAR are more concerned with the enhancement of the micro-climate and environmental conditions, especially in relation to the presence of pollution and the local temperature, particularly with regard to shelter from the sun and rain. There are five main attributes that are most important based on JTAR users' perception that contributed to comfort and convenience in a user-friendly street. These are (in order of importance): (i) 'free of pollution, noise, poor smells and vibration'; (ii) 'a lot of covered ways/shade and other protection from the sun and rain'; (iii) 'availability of dustbins, telephones and toilets'; (v) 'breezy'; and (iv) suitable temperature'.

The findings indicate that being 'free of pollution, noise, poor smells and vibration' are the main attributes under comfort and convenience quality that contribute to a user-friendly street in the context of Kuala Lumpur. According to Krupart (1985), the presence of these elements contributes to physical discomfort. In the context of Malaysian streets, the main contribution to this is the number of cars on the street and the dirty and poorly maintained streets. This is similar to findings by Carmona et al. (2008) who identify that these attributes are major elements that also contribute to the quality of streets in UK.

The findings also highlighted that in a Malaysian context, the most important attributes that contribute to comfort and convenience in street are the attributes that relate with microclimate conditions in space. The research reveals that covered ways/shade and other protection from the sun and rain affects the level of comfort and the convenience of the street. In the Malaysian climate, the use of outdoor space is strongly related to the environmental microclimate. People will more readily use the street in the areas that have a variety of activities and lots of trees and shelter. Even though, the facilities provided are safe, comfortable and sufficient if the environment is not conducive people will not use the place. It is proven that social activities can only exist in places that are conducive and safe to them. The need for shade and shelter is

important to reduce the heat and mitigate the effects of the climate in an urban area. The planting of greenery and trees in JTAR needs to be increased if the environment is to be improved for users. The selection of trees must also be considered carefully to ensure that they truly provide shade and the location of planting should be studied and designed so that they are placed in an area that really needs shade, especially areas that have wider walkways and low buildings. The findings confirm the theory that in urban areas, there is a strong relationship between microclimate conditions and the use of open space (Rapoport, 1990; Jacobs, 1996; and Nikolopoulou et al., 2007).

iii) The findings also indicate that easy access by foot is an important attribute perceived by users in line with Moughtin's (1992) findings that easy access by foot attracts more people and increase activities on the street. The research also reveals that the main aspects contributing to the ease of pedestrian movements are the conditions of pedestrian walkway (also related to maintenance), the presence of elements (clutter) and the material used for the pavement. These findings confirm the work of Jacobs (1996), Tibbalds (2001) and Carr et al. (1992) concerning the ease of pedestrian movement on the street.

c) Variation in the needs and perception of factors and qualities of the street between different types of users from different socio-demographic backgrounds towards a friendly street.

Streets in the city centre are used differently and for different reasons by different people. These differences show that needs and preferences are not general, but context bound, and are affected by local physical characteristics and environment as well as the backgrounds, culture, social connections between inhabitants, etc. within a particular place. These findings suggest that street planning and design and management should give greater consideration to different users' needs within a specific local context.

i) It was discovered that different types of user influence the variation in the factors that make a street friendly to them. In relation to JTAR, this research was interested in the daily users (those constantly engaged with the street), occasional users (periodic or seasonal) and non-users (people who do not use the street). Based on the findings in chapter 6, the attraction of daily users concerns the environmental quality, such as 'public spaces', 'buildings', 'the landscape' and 'public facilities' on the street. However, the attraction to occasional users is more on dependent upon functional aspects and activities on the street. It was also discovered that daily users are the group that spend the most time on JTAR during any particular visit. Therefore, this group is more aware of the environment issues and the need for more facilities for leisure and relaxing activities, and visual qualities such as good urban space, historical and unique

buildings, good maintenance and cleanliness, and public facilities. For the non-user group, the lack of factors and attributes mentioned above were the reasons they do not use the street.

ii) The findings also highlight that between these three groups, the occasional user group shows a more positive response concerning the importance of safety and security together with the comfort and convenience attributes. In terms of the safety aspects, the level of feeling safe when using the street is much higher for the daily group than the other two groups. The attributes under safety and security that shows significant difference between types of users are the 'presence of activities day and night', 'free of accidents', 'low crime statistics' and 'no graffiti and vandalism'.

iii) The research findings indicate that there are significant differences between the types of user and attributes under comfort and convenience. The findings reveal that out of seventeen attributes, ten of the attributes shows significant difference. These attributes are: 'comfort and convenient seating'; 'availability of seating places'; 'clear pedestrian signage'; 'lots of convenient places for shopping'; 'very clear direction of the place'; 'greenery'; 'attractive building facades'; 'a lot of outdoor cafes and refreshment kiosks'; and 'a lot of banking and communications centres'.

iv) In perception based on socio-demographic backgrounds, more variation was observed in the 'age groups' and 'distance from residence' group compared to others. Interestingly, there was no significant variation revealed in respect of the ethnic group. The various age groups show a significant difference in the strength of correlation with attributes of safety and security, especially the presence of people, presence of activities day and night, safe crossing devices and free of accidents and low crime statistics. The findings also revealed that different 'age groups' place significantly different importance to the attributes of comfort and convenience ('the presence of covered walkway and protection from rain and sun') and accessibility ('easy access by public transport', 'distance to destination from the parking areas' and 'sufficient parking'). The findings confirms the theories of Forysth (2003) and Turel et al. (2007) who identified that different age groups may perceive open space differently. Based on the findings, there is no significant variation between 'ethnicity' group in terms of the attributes of safety and security, comfort and convenience and accessibility qualities. These findings concur with Whyte (1980) and Shamsuddin (1997) who found that people with different cultures often used and perceived open space in much the same way.

8.3 Limitations of the research

A few limitations were observed in this research, in particular those relating to the questionnaire design, data collection method and data analysis. The limitations of this research include:

The study only covered one key street, Jalan Tuanku Abdul Rahman as the typical representative of urban commercial streets in Kuala Lumpur city centre. A multi case study would obviously be able to give richer data. However, this does not affect the data because JTAR itself extends for a length of 2.48 kilometres and also the data collected was not only from physical and activities observations on the street but also from a questionnaire survey and interviews with respondents that also use other Kuala Lumpur city centre streets.

The study encountered difficulties during the pilot questionnaire survey. The target respondents in this stage were street users in JTAR, however, only a few users responded to the questionnaires. Therefore, in the actual questionnaire survey the targeted respondents were Kuala Lumpur city centre residents more generally. The advantage of this was that the research collected data from not only users of JTAR but those who knew but didn't use the case study street. This enriched the data from the perspective of non-users towards the reasons why they do not use the street.

In this research, the study concentrated on the physical and functional dimensions which were limited to five important aspects of streets: the physical and functional qualities of the streets; the socio-demographic backgrounds of the users; the key uses and activities; and the users. The study does not go into the detail of the social aspects. Hence, there are many other aspects, such as the economy, governance, financial allocation and political processes that can all have considerable influence, which are not covered in this research. These aspects were not within the scope of this investigation due to man power and time constraints.

In this kind of research, the understanding of the actual behaviour on the site is important in order to understand the actual needs of the users and their relationships with the physical environment of the street. However, due to limitations of time, this study only looked at the pattern of activities on the site.

Clearly, there might be other factors and attributes that contribute to user-friendly streets. In this research, the data depended on the questionnaires, observations and the feedback from the interviewees. Maybe if other techniques were employed further findings could be derived.

8.4 Significance of the research

This research is significant and timely due to the rapid urbanisation and development of urban areas, especially in developing countries like Malaysia, in which most of the developments in urban areas replicate the design from elsewhere especially from the West and Europe without due consideration of the actual users of the streets, the local context in respect of the physical, functional and also social context. This is vital in order to create sustainable and liveable urban environments that are usable for all purposes, not only for occasional purposes but also to satisfy the need and desire for optional and social activities/purposes.

Currently in Kuala Lumpur city centre, there is a high demand for public spaces and urban commercial streets have to play a role as efficient urban public spaces. Furthermore, in the context of an urban commercial street, creating a user-friendly environment is significant for the place to become more liveable and at the same time creating a distinctive shopping district. As was stated in the urban design strategy in Kuala Lumpur Plan 2020, in traditional shopping precincts, of which JTAR is one, the street will be further developed as a specialised shopping district to become more attractive and comfortable to shoppers (KLCH, 2003). In the context of Malaysia, which is multiracial, multicultural and multi religious, the factors, attributes and needs of users from different types of user and socio-demographic backgrounds need to be considered in order to achieve this strategy.

The research findings are based on the factors that contribute to the use of the street. The attributes revealed, which are based on the users' perception of user-friendly streets, will help to develop policies to encourage more people to walk rather than travel by car in Kuala Lumpur. These findings can also assist the government to identify and target future progress and appropriate strategies based on local needs. The importance of research based on users' needs is also identified by Rapoport (1986) who stressed that in designing space, designers need to approach the problem differently according to the desire of the users and that things should be done to achieve supportive characteristics of these desired uses and activities.

Based on the key factors and the attributes that contribute to the user-friendly street, it is hoped that a better understanding and different approach can be taken by urban designers and planners to tackle this issue contextually rather than based on a general design solution. Indeed, the policies and guidelines for development of Kuala Lumpur are not currently based on the needs of the urban users. The findings from this research will help to provide input for improved and holistic guidelines that are not only based on the political and designers perspective but more importantly on those of the users of the street.

The findings of this research also highlighted five key factors that most affect the friendly street to the users in urban commercial streets in the context of Kuala Lumpur: 'attractiveness'; 'activities'; sense of crowding and congestion; proximity; and familiarity' together with five other supportive factors: 'public space; greenery/trees; public amenities; maintenance; and freedom of action. As such, these are the main factors that need to be considered to improve the level of a friendliness of urban commercial streets in the context of Malaysia. The city's urban planners and urban designers should therefore take these into account in striving to create richness of city living and bringing quality life back into the city.

This research is specific for urban commercial streets in Kuala Lumpur city centre. The research is important because there are differences in climate, in spatial conditions, quantity of and composition of traffic, legal position, culture and life style. Clearly different solutions are required for different types of situations and places. User's perception on the quality of the streets (chapter seven) in this research reveals that contextualised guidelines outlining the design of characteristics in the urban commercial street particularly and other street generally are important for future revitalisation, regeneration and development.

A pedestrian friendly environment in the city centre can be created by having less motorised traffic. Additionally, increasing the level of accessibility by foot as revealed in one of the findings above will significantly increase pedestrian movement (see Chapter 7). The improvement of public transport facilities can also improve accessibility and encourage pedestrian friendly environments. Significantly, in 2009, the percentage of public transportation users was only 10 to 12 per cent in Malaysia (ETP 2010). This has been identified as a key priority by the Department of Transportation, which targets an increase in the number of public transportation users in Malaysia to 25 per cent by 2012 and 30 per cent by 2015 (RMK, 2010).

Finally, it is hoped that these research findings will provide a knowledge base for local authorities and possibly interest groups to tackle, prevent and prioritise current and future problems regarding pedestrian needs in the creation of user-friendly streets in urban areas. It may also help to improve the understanding of user-friendly streets within a specific context, thus developing an important tool for the stakeholders such as decision makers, politicians, urban designers) to implement better conditions for the urban users' quality of life.

8.5 Implication of findings

The findings of the research have implications for urban design and planning implementation concerning urban commercial streets in city centres. Even though the implications discussed pertain to the context of a particular urban commercial street in Kuala Lumpur, it may also have

implications for similar types of streets and other types of urban spaces in city centres in other countries with similar contexts. The implications of the findings to the planning and urban design of places in the local context can be significant through the consideration of the following factors:

According to the Government Transformation Programme (GTP, 2010), creating friendly urban commercial streets in Kuala Lumpur city centre is one of the objectives and targets to transform Malaysia in accordance with the national vision for 2020. Hence, in the National Urbanisation Policy (2006) and the Kuala Lumpur Structure Plan 2020 reports, in order to create desirable living environments and to ensure the street environments in Kuala Lumpur city centre are accommodating for all users, the urban environment must be friendly to the users especially pedestrians.

The findings suggest that in order to create street environments that are inviting and desirable to all users, the factors and attributes that contribute to user-friendly street should be integrated in urban planning and urban design interventions. Therefore, in the context of this study, in order to develop a user-friendly urban commercial street, the factors and attributes can be identified from the most significant needs and perception of the users. The findings of this research identify actual users' needs and perceptions and therefore may contribute to guidelines for future developments.

8.6 Contributions of the research

This research fills in the gap in the body of knowledge relating to user-friendly street in urban areas. The concept of a user-friendly street has been studied elsewhere in the context of shopping streets, neighbourhoods, connections between residents and their neighbourhood. It has not, however, been studied in the context of an urban commercial street in Malaysia. This research contributes to the body of knowledge in the context of urban places, which focuses upon the urban commercial street of a city centre that is friendly to its users. The research also establishes the needs of users in a specific context and in a specific type of public space. This is important because different places have different climates, ways of life, public awareness and cultures. Therefore, the level of importance of factors and attributes that revealed from this research is different from the findings from previous studies. According to Reeves (2005, p.29) *"where we live defines us. Where we live affects how we live, who we interact with, and what we eat, our moods and feelings, our health and well-being"*.

Many previous studies looked at specific users pertaining to a friendly street and focussed on specific groups of users, such as disabled people or older people in the outdoor built environment (Burton et al., 2006) or looked at the aspect of people-friendly cities as a whole

(Tibbalds, 1992). This research has established the needs of street users as a whole, and not specifically for people with disabilities that comprise a small percentage of the entire population. Many everyday activities have an impact upon peoples' mobility such as parents pushing a pram, people carrying heavy shopping bags, pregnant women, women with children and elderly people.

The findings from the research revealed that the 'safety and security' aspect is the most important quality of the street that contributes to user-friendly street in the Kuala Lumpur context. This finding is parallel with most previous studies. However, there are differences between the most important attributes that contribute to safety and security in the study with those identified in previous studies. In this research, the most important attributes were 'the presence of police surveillance'; ' free of accidents and low crime statistics'; 'safe crossing devices'; 'safe environment for the elderly, disabled and children'; and 'free of the presence of anti-social behaviour'. The same applies to the attributes under comfort and convenience in the Malaysia context in which the findings indicate 'free of pollution, noise, smell and vibration'; 'a lot of covered ways/shade and other protection from sun and rain'; 'availability of dustbins, telephones and toilets' ; and ' breezy and suitable temperature'. Also, for accessibility 'easy access by foot' is the most important attribute contributing to a user-friendly street. This fills the gap in terms understanding the most important attributes that need to be considered in the design and guidelines for urban commercial streets, particularly in Malaysia city centre.

The research looks at the variations between different groups of people (occasional users, daily users and non-users) and socio-demographic backgrounds of the street users. Therefore, this research contributes to variations in users' needs and perceptions towards factors and attributes that make a street friendly based on the types, background and age group of users since this factor has not been covered in previous research. This research will contribute to the body of knowledge of more specific needs of users in terms of different types of users and socio-cultural groups. Even though, previous studies have addressed users' needs in open spaces (Laukaitou-Sideris, 1995; Carmona et al., 2003; Mehta, 2007, 2009) the specific needs were based on different types of user on the urban commercial street and the specific needs based on the socio-demographic backgrounds of users in Malaysian context towards a friendly street have not been previously addressed.

In this research, several urban design strategies have been recommended that can be implemented to improve the level of user-friendly streets in Kuala Lumpur city centre for commercial streets and other streets, elsewhere in a similar context. This is in line with the government plan in the Government Transformation Plan (GTP), National Urbanisation Policy

(NUP) and Kuala Lumpur City Plan 2020, which all emphasise the need for user-friendly urban environments.

In conclusion, this study substantiates that a user-friendly street is central to a successful street. Such streets should be liveable, walkable, usable and sustainable and contextually sensitive whether they be in Malaysia or elsewhere. Hence, the findings fulfil a gap in knowledge by identifying the most important needs and users' perceptions of a friendly street based on the situation in Malaysia, which has a different environment, climate, social activities and cultural context. The users' perceptions of a user-friendly street will have implications on the approach and process of street design.

8.7 Suggestions for future research

This research provides findings concerning the significant factors and influencing attributes that make a user-friendly street and the users' perceptions of a user-friendly street. Despite the contributions of the present research to explore the needs of users and users experience and perceptions towards a friendly street, some results require further examination. Such a suggestion is made because the field of study is so important in our desire to create successful cities. The research can be further explored by further studies of specific users' behaviour in relation to the physical environment of the street. This study could relate to how exactly people in the Malaysian context behave on the street and how they use the facilities and act with the amenities available along the street.

In addition to the physical and functional qualities, the social qualities were also identified as one of the main criteria that contributed to a user-friendly street. However, due to the limitations in this research the social qualities were not thoroughly studied in and are suggested for further research. The justification for this limitation was explained under the limitation of studies in the Research Methodology (Chapter 4). The study of specific social qualities of a street that contribute to a friendly street in the Malaysia context is also another dimension that can be further researched.

In this research, unstructured interviews were conducted with respondents in JTAR to further probe issues that were not addressed in the survey and to solicit further potential issues. It is suggested that in future research, in order to get richer data from group of respondents with different socio-demographic background especially respondents from different cultural, racial, religious, gender, level of income and age, the focus group technique should be targeted in the interviews (Abdul Latip, 2011; Pain et al. 2002).

In this research, the study was based on the users of the street in Kuala Lumpur who were able-bodied and those who are less able such as the elderly, children and pregnant women. A further study should be more inclusive and include those with less mobility and disabilities such as wheelchair users, the visually impaired and the hearing impaired.

The above suggestions will provide further detailed findings that can further improve guidelines for improving the quality of urban streets as well as the quality urban environments, which contribute to good quality of life in urban areas.

8.8 Conclusion

In this chapter, the summary of the main research findings, contributions of the research, recommendations and suggestions for future research were presented. This research has provided further urban design knowledge and can guide practice by filling the gap in terms of research-informed knowledge of user-friendly urban commercial streets in Kuala Lumpur, particularly, and more generally in Malaysia. Thus, fulfils the needs of the users of the street not only for 'necessary' but also for 'optional' and 'social' purposes (to use Gehl's term). This will support the government's aim in the recent Malaysian Economic Transformation Programme, which is to spur economic development and improve the quality of the living environment in the city. Hence the Kuala Lumpur Structure Plan 2020, which will be gazetted in July next year, also aims to develop a policy framework and guidelines to create a desirable living environments in the city as one of its aims. It is important to understand the key factors and attributes associated with a user-friendly street from the users' perception and needs in a specific context. Using the key factors and attributes explored in this research will guide future development planning and design in urban streets and prevent a repeat of the many mistakes of the past as well as providing an understanding of the needs of users in a specific context.

The research established five key factors that make urban commercial street friendly to its users - attractiveness, activities, congestion, proximity and familiarity. The research also established another five supportive factors that contribute to a user-friendly urban commercial street in the Malaysian context - public space, greenery/trees, public amenities, maintenance and freedom of action. This identifies the factors that need to be carefully considered in future guidelines and policies for the planning and design of urban commercial streets in Kuala Lumpur.

This research also looked at the qualities of the street based on users' perceptions of what makes a street friendly. The findings have identified that safety and security, comfort and convenience, and accessibility, the qualities of safety and security are the most important criteria that make a street friendly. Under safety and security, the users indicated that the presence of

police or security surveillance; free of accidents and low crime statistics; safe crossing devices; safe environment for elderly, disabled and children; and free of presence of anti-social behaviour as the main attributes that contribute to the feeling of safety and security of the street. Meanwhile for comfort and convenience: free of pollution, noise and vibration; covered ways/shade and other protection from the sun and rain; availability of dustbins, telephones and toilets, breezy environment; and suitable temperatures are the main attributes that contribute to the feeling of comfort associated with a user-friendly street. For the accessible quality of streets, the attribute that is most important to the street users is easy access by foot.

It is hoped that these factors and qualities, which are generally lacking in urban streets at present, will be taken into consideration by those involved with decision making in respect to urban design guidance to create a user-friendly street environment for users. All these attributes have been revealed as main criteria that contribute to user-friendly urban commercial streets in Kuala Lumpur city centre. It is hoped that these will be seriously considered in the practice of street planning and street design not only of specific urban commercial streets but also for other types of street that have similar context.

The research also suggests that even though the factors and attributes revealed are based on the local issues and setting, many of the findings are also applicable to the global urban street context. This might be pertinent to other places in the global context that have a similar kind of users' behaviour, climate and culture. The significance of this research to the body of knowledge is that it has examined the issues of an urban commercial street from the perspectives of the users' needs and perceptions in respect of the physical, functional and social dimensions of streets in Kuala Lumpur. This had not been addressed by previous research. It also identified the key reasons in terms of factors and attributes, and also variations between the type of users and socio-demographic backgrounds in their perceptions towards user-friendly streets in a South-East Asian country.

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APPENDIX 1

Attributes of Friendly Street as identified in the literature review

Qualities	Physical and spatial pattern																				People and activity								Image and meaning								
Attributes	Greeneries	enclosure	arrangement of the street	Proportion and dimension	Quality engaged with the eyes	Definitions	Transparency	Unity	variety	safety	legibility	aesthetics	character	scale	personalisation	continuity	imageability	Accessibility and linkages	permeability	vitality	Diversity/choice	Comfort/convenience	interest	Fit/robustness	Liveability/responsive	Transaction	Distinctiveness	sociability	sense	awareness	adaptability	Control/freedom of action	Perception	maintenance	cultural	relaxation
Elements																																				
Authors																																				
Lynch (1981)											*						*	*			*	*		*	*				*			*				
Bentley et al					*				*		*				*				*					*	*											
Tibbalds		*		*										*																						
Dolbani	*								*	*		*				*		*														*		*		
PPS 2003										*																		*								
Moughtin																																				
Carmona et al		*	*							*		*	*	*	*			*			*	*		*				*								*
A.Jacobs	*	*	*	*	*	*	*	*		*				*				*			*				*											
Carr et al			*		*				*	*			*				*				*	*														*
Whyte									*	*								*			*	*	*		*			*								*
Gehl									*	*								*			*	*														
Woolley																				*	*	*						*	*							
Rivlin																						*														
Abbasaddeh																																				
Ujang N										*	*	*		*	*		*	*	*	*	*	*	*	*		*	*						*			
Rapoport	*	*	*	*	*				*	*				*				*				*											*		*	
J.Jacobs							*			*																*										
Alexander		*	*	*					*	*				*		*					*	*														
Warpole										*																										
Rubenstein (1992)			*		*		*		*		*	*		*		*					*	*							*					*		
Shuhana et al (2004)				*	*													*	*			*					*	*								
Lang (1994)		*			*				*	*		*	*	*	*			*				*	*	*					*	*	*	*		*		

Qualities	Physical and spatial pattern																					People and activity									Image and meaning								
Attributes	Groupings	enclosure	arrangement of the street	Proportion and dimension	Quality engaged with the eyes	Definitions	Transparency	Unity	variety	Safety / security	legibility	aesthetics	character	scale	personalisation	continuity	imageability	Accessibility and linkages	permeability	vitality	Diversity/choice	Comfort/convenience	interest	Fit/robustness	Liveability/responsive	Transaction	Distinctiveness	sociability	sense	awareness	adaptability	Control/freedom of action	Perception	maintenance	cultural	relaxation
Smith et al (1997)									*	*	*	*	*					*			*	*	*	*					*	*			*				
Jarvis (1993)								*	*	*												*	*														
Lennard		*	*			*				*			*									*															
Appleyard (1981)										*												*					*											
Mehta (2007)	*								*						*				*		*	*						*				*						
Krupat (1985)										*												*			*													
Mehta (2009)																																						
Montgomery (1998)												*								*	*	*							*			*						
Robertson (1991)										*								*			*	*						*										
Dumbaugh (2005)										*															*													
Knack (2008)										*						*		*						*	*									*	*			
Hussein (2003)										*		*										*																

Qualities	Physical and spatial pattern																				People and activity									Image and meaning										
Attributes	Greenries	enclosure	arrangement of the street	Proportion and dimension	Quality engaged with the eyes	Definitions	Transparency	Unity	variety	Safety / security	legibility	aesthetics	character	scale	personalisation	continuity	imageability	Accessibility and linkages	permeability	vitality	Diversity/choice	Comfort/convenience	interest	Fit/robustness	Liveability/responsive	Transaction	Distinctiveness	sociability	sense	awareness	adaptability	Control/freedom of action	Perception	maintenance	cultural	relaxation	coherent
Martincigh (2003)										*		*						*				*															
Nasar (2008)										*		*										*															
Vanconcellos (2004)										*												*			*				*		*						
Antupit et al (1996)																				*	*																
Owens (1993)										*											*	*			*									*				
Kaplan (1982)											*										*																*
Plowden (2003)									*	*		*				*		*				*	*		*									*			
Cullen					*			*				*		*																							
Appleyard (1983)	*		*							*			*				*	*				*			*			*				*			*		
Trancik	*													*																							

PhD ARCHITECTURE (SOCIAL SCIENCE)
SCHOOL OF BUILT ENVIRONMENT
UNIVERSITY OF NOTTINGHAM

Dear Sir/ Madam,

User Friendly Street, a case study of Jalan Tuanku Abdul Rahman, Kuala Lumpur Malaysia.

This survey is of part of a research project conducted by myself for the degree of Doctor of Philosophy at the University of Nottingham, United Kingdom. The purpose of the survey is to find out why people use and not use the street and how the user of the Jalan Tuanku Abdul Rahman perceived their urban street. You have been selected at random to take part in the survey and it would be really appreciated if you could spare some time in answering these questions.

The information that you provided will remain strictly confidential and is used solely for academic purposes. I believe you are the best person who can give me the insight on this study.

There will be a second part of this survey which takes the form of a focus interview. If you are willing to participate in this interview, please inform the interviewer when you are likely to be available for the interview. We will then get back to you to arrange for an appointment.

Your cooperation in this matter is very much appreciated

Thank you.

Yours sincerely

.....

Norhafizah Binti Abdul Rahman
Lecturer, Faculty of Architecture, Planning and Survey,
University of Teknology MARA

APPENDIX 2

QUESTIONAIRE SCHEDULE (DYNAMIC USER)
Investigating user's need towards 'user-friendly street'. (Jalan Tuanku Abdul Rahman)

Date :	Time :	Place/Location:
Please underline/ tick your answer. Thank you for your time and cooperation		

1. Have you been to Jalan Tuanku Abdul Rahman?
   1. Yes
   2. No, please justify why you do not use this street and proceed to SECTION B

.....
.....

SECTION A: User's activities in streets

2. Why do you come to this place? Please rank based on the most frequent reason (from 1 the most to 9 the less) you come to this place.

Activities	1	2	3	4	5	6	7	8	9
Shopping									
Visiting									
Meeting Friends									
Relaxing									
Studying									
Entertaining									
Live there									
Others (please specify)									

3. Frequency of visit to the place
   1. Once a week
   2. Twice a week
   3. Every other day
   4. Every day
   5. others (please specify).....

4. Duration of visit
   1. less than 1 hour
   2. 1-4 hours
   3. 5-8 hours
   4. 9-12 hours
   5. more than 12 hours

5. When you always come to this place? Why?
   1. Morning
   2. Afternoon
   3. Evening
   4. Night
   5. Others (please specify) : .....

6. How do you come to this place?
   1. Car
   2. Bus
   3. Taxi
   4. LRT/Commuter
   5. Motorcycle
   6. Others (please specify): .....

7. Do you visit this place every time you are in KL?
   1. Yes
   2. Most of the time
   3. Sometimes

8. What is the main attraction of this place?
   1. the shopping centers
   2. the public facilities
   3. the buildings
   4. the public spaces
   5. the landscapes
   6. the best place to earn money or income
   7. Others (please specify):.....

9. Do you like to come to this place in your free time? Why?
   1. Yes
   2. No

.....
.....

10. Normally with whom you come to this place? Why?
   1. alone
   2. couple
   3. peers
   4. family
   5. Others (please justify):.....

SECTION B: User's Perception

11. Name 3 streets that you always visit in Kuala Lumpur? Why?
   1. .....
   2. .....
   3. .....

.....
.....

12. Is segregation of vehicular and pedestrian traffic important to encourage the use of the street? Why?
   1. Yes
   2. No

.....
.....

13. Is lighting for night activities important to encourage use of the street? Why?
    1. Yes
    2. No

.....

.....

14. Is the criteria below is important to encourage you to use this street?

		Strongly Important	Slightly Important	Slightly unimportant	strongly Unimportant
a)	Presence of people				
b)	Presence of security official and patrol police				
c)	Presence of activities				
d)	Safe crossing devices				
e)	Full of activities day and night				
f)	Safe environment for elderly, disabled and children				
g)	Low traffic flow and speed				
h)	Free of accidents				
i)	Low crime statistics				
j)	Free of the presence of anti-social behaviors				
k)	No graffiti and vandalism				

15. Does this place give you the opportunity to walk and interact with each other?
    1. Yes
    2. No

16. Do you feel safe to use this street alone? Why?
    1. Yes
    2. No

.....

.....

17. Are the criteria of comfort below important to encourage you to use of the street?

		Strongly important	Slightly important	Slightly unimportant	strongly unimportant
a)	A lot of verandah way/shade and other protection from sun and rain				
b)	Free of pollution, noise, smell and vibration				
c)	Breezy				
d)	Suitable temperature				

18. How do you rate the criteria that make you feel easy to use the street?

		Strongly Agree	Slightly Agree	Slightly disagree	Strongly Disagree
a)	Width of the walking space				
b)	Lot of rest area and seating places				
c)	Comfortable and sufficient seating				
d)	Seating places adjacent to pedestrian flow				
e)	Very clear pedestrian signage				
f)	Lots of convenience place for shopping				
g)	Very clear direction of the place				

h)	A lot of greenery (trees/shrubs/flowers and grass)				
i)	Very attractive building facades				
j)	Availability of dust bins, telephones and toilets.				
k)	A lot of outdoor cafes, refreshment kiosks				
l)	Lot of banking and communications centre				
n)	A lot of spots for entertainment				
o)	A lots of recreation facilities				

19. How do you rate the condition of this street?

		Excellent	Good	Fair	Poor
a)	Cleanliness of the street				
b)	Maintenance of pavements (e.i repairing broken paving slab)				
c)	The people in this place care about each other				
d	Choices of activities				
e	Pleasing place visually				

20. How do you rate the importance of the criteria of accessibility and proximity?

		Strongly important	Slightly important	Slightly unimportant	strongly unimportant
a)	Easy access by public transport				
b)	Easy to get to by foot				
c)	Sufficient parking				
d)	No physical barrier, wall, building, fence, curb.				
e)	Well connected to paths of circulation or other places				
f)	Meeting places for people from different culture				
g)	Visibility of different activities				
h)	Distances to areas from the parking area				
i)	Distances to areas from public transport				

21. Does this place satisfy your personal needs? Why?

.....

.....

22. What improvements need to be done to this street to encourage using this street more in the future?

.....

.....

.....

SECTION C: Personal Profile

23. Marital status
    1. single
    2. married

24. Please state your highest level education
    1. No academic qualification
    2. Primary education
    3. Secondary education
    4. College or Institute
    5. University education

25. Occupation
    1. Unemployed
    2. Self employed
    3. Private
    4. Government
    5. Others (please specify).....

26. Age Group
    1. Under 18
    2. 18-25 years old
    3. 26-45 years old
    4. 46-59 years old
    5. Above 60 years old

27. Distance from residence.
    1. Less than 1 KM
    2. 1- 5 KM
    3. 5-10 KM
    4. 10-15KM
    5. 15-20KM
    6. More than 20 KM

28. Gender
    1. Male
    2. Female

29. Ethnicity
    1. Malay
    2. Chinese
    3. Indian
    4. Others

30. Monthly income
    1. Below RM 1000
    2. 1000-3000
    3. 3000-6000
    4. above RM6000

THANK YOU

APPENDIX 3

PhD ARCHITECTURE (SOCIAL SCIENCE)
SCHOOL OF BUILT ENVIRONMENT
UNIVERSITY OF NOTTINGHAM

Dear Sir/ Madam,

User-friendly street, a case study of Jalan Tuanku Abdul Rahman, Kuala Lumpur Malaysia.

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You have been selected at random to take part in the survey and I would be really appreciated if you could spare some time in answering these questions.

The information that you provided will remain strictly confidential and is used solely for academic purposes. I believe you are the best person who can give me the insight on this study.There will be a second part of this survey which takes the form of a focus interview. If you are willing to participate in this interview, please inform the interviewer when you are likely to be available for the interview. We will then get back to you to arrange for an appointment.

Your cooperation in this matter is very much appreciated

Thank you.

Yours sincerely

.....

Norhafizah Binti Abdul Rahman
Lecturer, Faculty of Architecture, Planning and Survey,
University of Technology MARA

QUESTIONAIRE SCHEDULE (STATIC USER)

Investigating user's need towards 'user friendly street'. (Jalan Tunku Abdul Rahman)

Date :	Time :	Place/Location:
Please underline/ tick your answer. Thank you for your time and cooperation		

SECTION A: User's Perception

1. What is the main attraction of this place?
   1. the shopping centres
   2. the public facilities
   3. the buildings
   4. the public spaces
   5. the landscapes
   6. the best place to earn money or income
   7. Others (please specify):.....

2. Is segregation of vehicular and pedestrian traffic important to encourage the use of the street? Why?
   1. Yes
   2. No

.....
.....
.....

3. Is lighting for night activities important to encourage use of the street? Why?
   1. Yes
   2. No

.....
.....

4. Is the criteria below is important to encourage people to use this street?

		Strongly Important	Slightly important	Slightly unimportant	Strongly Unimportant
a)	Presence of people				
b)	Presence of security officer and patrol police				
c)	Presence of activities				
d)	Safe crossing devices				
e)	Full of activities day and night				
f)	Save environment for elderly, disabled and children				
gi)	Low traffic flow and speed				
h)	Free of accidents				
i)	Low crime statistics				
j)	Free of the presence of antisocial behaviour				
k)	No graffiti and vandalism				

5. Does this place give you the opportunity to walk, play and interact about each other?

1. Yes
2. No

6. Do you feel safe to use this street alone? Why?

1. Yes
2. No

.....

.....

7. Are the criteria of comfort below important to encourage you to use of the street?

		Strongly important	Slightly important	Slightly unimportant	Strongly unimportant
a)	A lot of verandah way/shade and other protection from sun and rain				
b)	Free of pollution, noise, smell and vibration				
c)	Breezy				
f)	Suitable temperature				

8. How do you rate the criteria that make you feel easy to use the street?

		Strongly Agree	Slightly Agree	Slightly disagree	Strongly Disagree
a)	Width of the walking space				
b)	Lot of rest area and seating places				
c)	Comfortable and sufficient seating				
d)	Seating places adjacent to pedestrian flow				
e)	Very clear pedestrian signage				
f)	Lots of convenience place for shopping				
g)	Very clear direction of the place				
h)	A lot of greenery (trees/shrubs/flowers and grass)				
i)	Very attractive building facades				
j)	Availability of dust bin, telephones and toilet.				
k)	A lot of outdoor cafes, refreshment kiosks				
l)	Lot of banking and communications centre				
n)	A lot of spots for entertainment				
o)	A lots of recreation facilities				

9. How do you rate the condition of this street?

		Excellent	Good	fair	Poor
a)	Cleanliness of the street				
b)	Maintenance of pavements (e.i repairing broken paving slab)				
c)	The people in this place care about each other				
d)	Choices of activities				
e)	Pleasing place visually				

10. How do you rate the importance of the criteria of accessibility and proximity?

		Strongly important	slightly important	Slightly unimportant	strongly unimportant
a)	Easy access by public transport				
b)	Easy to get to by foot				
c)	Sufficient parking				
d)	No physical barrier, wall, building, fence, curb.				
e)	Well connected to paths of circulation or other places				
g)	Meeting places for people from different culture				
h)	Visibility to reach out the activities				
i)	Distances to areas from the parking area				
j)	Distances to areas from public transport				

11. Does this place satisfy your personal needs? Why?

.....

.....

12. What improvements need to be done to this street to encourage using this street more in the future?

.....

.....

SECTION C: Personal Profile

13. Status
    1. Malaysian (From KL, From outside KL)
    2. Non Malaysian (Working in Malaysia)

14. Please indicate
    1. Length of engagement/stay:..... Years
    2. Type of business/shop /occupation: .....

15. Please state your highest level education
    1. No academic qualification
    2. Primary education
    3. Secondary education
    4. College or Institute
    5. University education

16. Age Group
    1. Under 18
    2. 18-25 years old
    3. 26-45 years old
    4. 46-59 years old
    5. Above 60 years old

17. Gender
    1. Male
    2. Female

18. Ethnicity
    1. Malay
    2. Chinese
    3. Indian
    4. Others

19. Monthly income
    1. Below RM 1000
    2. 1000-3000
    3. 3000-6000
    4. above RM6000

THANK YOU

APPENDIX 4

Recording Sheet (Activities)

Date: Location: Time begin: Time end:	Temperature: Weather conditions: Remarks:
Types of activities: (W)Walking (P)Play/performance (ST)Standing (S)Sitting (E)Eating/drinking (SM)Smoking (R)Reading (C)Conversing (SH)Shopping (WS)Window shopping (SL)Sleeping/lying Others:	Notes:
Total= Adult (M) Adult(F) Old (M) Old (F) Teenager Children	

APPENDIX 5

Physical Characteristics in JTAR (Field survey)

Dimensions	Elaboration	Zone 1			Zone 2	Zone 3			Zone 4			Zone 5		
		A	B	C	A	A	B	C	A	B	C	A	B	C
Pavement														
	Material-quality/strength and durability	tile	Granite/ slab	Granite/slab	Slab/granite	Interlocking	Tile	Concrete	Concrete slab	Concrete slab	Concrete slab	Small concrete slab	Interlocking/ concrete slab	Concrete slab
	Tactile/pavement surface	Medium course	Hard course	Hard course	Hard course	Medium course	Medium course	Medium course	Medium course	Medium course	Medium course	medium	medium	medium
	Pavement clutter	Bin	Seating bin and lighting		Tree/seating	-	Trees/ dustbin	Trees motorcycles	Seating /tree/ lighting	Dustbin/tree/ lighting	lighting	dustbin	-	trees
	Condition/ maintenance	medium	fair	fine		√ ok	√ ok	not	bad	bad	fair			
Pedestrian routes	-Straight/winding -length	Straight 9m	Straight 7m	Straight 3m	Straight 7.5 m	Straight 4.5m	Straight 4m	Straight 3m	straight	straight	straight			
Kerb	Kerb lines Kerb extension	standard	standard	standard	Standard on sketch				standard	standard	standard	standard	150mm	150mm
Ramp	Gradient	-	-	-	-	-	-	-	1: 12	-	-			
	Surface	-	-	-	-	-	-	-						
Steps	Rise of steps	-	-	-	-	-	-	-						
	Step width	-	-	-	-	-	-	-						
Road crossing/ crossing facilities	Traffic signal/crosswalk signals	3 nos	2 nos	1 nos	5 nos	-	-	1 nos	3 nos	-	-	√	-	√
	Waiting times	45 sec	4 min	1 min	1 min	-	-	Not function	20 sec	-	-	2 min	-	2 min
	Distance from one crossing to another	map	map	map	map			On map	On map	-	-			
	Crossing distance				12m			15m	9 m	-	-	9m	-	9m
	Location				map			On map	map	-	-			
	Waiting space	2m	3m	2m	√			Block by motorcycle				2m	-	2m
	Sight lines	-	-	-	-	-	-	-				√	√	√
	Suitability for different mobility and visibility needs	-	-	-	-							-	-	√
Public transport	Types of public transport available	Bus/taxi & monorail	Bus/taxi & monorail	Bus/taxi	-	Bus/taxi	Bus/taxi	Bus/ taxi	No bus stop	no	no			

	Real time information	-	-	-	-	–	-	-	-	-	-			
	location	map	map	map		map	map	map	-	-	-			
Bus stops	Waiting environment: -lighting -seating material -litter bins -shelter(protection from weather) -signs (to-from) -walking map -tourist information	Nil	√ 1 nos √ Steel 3 nos √ √ too small - -	√ 1 nos √ steel 1 nos √ √ - -	√ 1 nos √ steel 1 nos √ √ - -	√ 1 nos - Steel √ √ √ too small - -	√ 1 nos √ Steel √ √ - - -	Nil - - - - - - -	-	-	-	√ - Steel 2nos -	-	-
Car parking	-distance to pedestrian walkway -directness/clearly mark - Quality of route from car parking to destination	-	-	-	-	-	Besides √ fair	30m √ fair	-	-	-	-	√ 1m Not clear Not safe	-
Food kiosks/ outdoor cafes	-types of selling	-	-	-	-	-	√	√	-	-	-	textiles	-	-
Street signs	-location	-	-	√	-	-	-	-				-	-	√
Traffic signs	-location				√	√	√	√	-	-	50km/h	√	√	√
Fountains and water	Location condition	-	-	-	-	-	-	-	-	-	-			
Street lighting	Location Spacing Height	Map 10m standard	Map 10m standard	Map 10m standard	Map 10m standard	√ 10m standard	√ 10m standard	√ 10m standard	√ 10m standard	√ 10m standard	√ 10m standard	√ 10m standard	√ 10m standard	√ 10m standard
Bollards	location	4 nos	18 nos	17 nos	29 nos							4 nos	-	-
Seating	Design Type of seating; no.of seating	√ public	√ Public 12 nos	-	√ 7 nos	-	-	-	19 nos timber	-	-			
	Secondary seating:	-	-	-	-	-	Low wall besides parking	Step in front of bazaar city	Step in front of sogo	steps	-	Planter box	-	Planter box
	Material	Timber/ pebble wash	Timber/ pebble wash		Timber/ pebble wash	-	Concrete block	Tile				tile	-	Pebble wash
	Location	map	map											

Telephone kiosks	Location	1 nos	3 nos (cannot be use)	3 nos	3 nos	√ 1 nos	√ 2 nos	√ 1 nos	√ 1 nos	-	√ 2 nos	1 nos	-	-
	Distance from one to another		7 m	10 m	10 m		1 m					-	-	-
Public toilets	Location Number	-	-	-	-	-	-	-	-	-	-	√ 1nos	-	-
Trash container	Location Number Condition	3 nos Not good	4 nos good	3 nos good	5 nos good	√ fair	√ fair	√ fair	13 nos	2 nos	2 nos	2nos	2nos	-
traffic	Traffic speed	50km/h	50km/h	50km/h	50km/h	30km/h	30km/h	30km/h	50km/h	50km/h	50km/h			
Traffic calming	Speed limit	-	-	-										
	Road humps	-	-	-	-		-	-	-	-	-	-	-	-

APPENDIX 6

Results from observations in the context of activities in JTAR

Time/day	Location	Character of the area	Types of activities
Weekdays (1.00- 2.45 pm)	Chow Kit area(UO Superstore)	The weather are hot and sunny day, no shadow and no people sitting Lack of seating -traffic jam along the street	Most of the activities were walking (80), standing (45) eating and drinking (35). Others activities were shopping (35), smoking (10), window shopping (10) and reading (3).
Weekends (1.00- 2.45 p.m)	UO Superstore	Environment with music -hot -road crowded with motorist	Walking (150) Standing (60) Sitting(50) –bus stop Eating/drinking (20) Smoking(10) Reading (10) Conversing (20) Shopping(100) Window shopping(80)
Weekdays (1.00- 2.45 pm)	Mydin area	Windy and cloudy Shady trees Seating provided	Walking (30), standing (35), Sitting (35), eating and drinking (5), Conversing(15), Shopping (40), window shopping (25)
Weekends (1.00- 2.45 p.m)	Mydin area	Create good connection from Chow Kit to 'Mydin' people seated in bus stop area and under shaded trees. Sitted on planter box as secondary seating. environment noisy with monorail, song (Indonesian songs) 'dangdut' and motorist many foreigner especially Indonesian this area was selling lots of Indonesian products such as herb and "jamu"	Walking (80) Standing(60) Sitting (30) Eating/drinking (10) Smoking(10) Reading (5) Conversing (25) Shopping (50) Window shopping(45) Waiting at the edges (30)
	Maju Junction	Water features Big trees Seating provided Cloudy	Walking (35) Standing (20) Sitting (20 Eating and drinking (15) Smoking (5) Shopping (30)

			Window shopping (20)
Weekdays (1.00- 2.45 pm)	Petama (Shopping complex)	Big trees Cosy environment Awning/shelter provide Kiosk along the street Seating provided Taxi stop	Walking (30) Standing (20) Sitting (20) Eating/drinking (15) Smoking(5) Reading (5) Conversing (20) Shopping (20) Window shopping (10) Road crossing (10)
Weekends (1.00- 2.45 p.m)	Petama (Shopping complex)	As a linkage from Maju Juction to SOGO -traffic jam(crowded) -load unload activities	Walking (80) Standing (60) Sitting (25) Eating/drinking (35) Smoking (10) Reading (15) Conversing (20) Shopping (50) Window shopping (45)
Weekdays (1.00- 2.45 pm)	SOGO	Tree shading (medium size trees) Staircase act as sitting at SOGO entrance Food kiosk Zebra crossing Wide platform at SOGO entrance Bus stop and taxi stop	Walking (75) Standing (50) Sitting (50) Eating/drinking (20) Smoking(5) Reading(5) Conversing(5) Shopping(20) Window shopping(20)
Weekends (1.00- 2.45 p.m)	SOGO	-more people seated on staircase and planter box	Walking (50) Standing (80) Sitting (60) Eating/ drinking (50) Smoking (20) Reading (10) Conversing (30) Shopping (100) Window shopping (6))
	Gulati's	Pleasant environment Wide pedestrian area Surrounded by textiles product Medium trees	Walking (300 Standing(20) Sitting(15) Conversing(10) Shopping(15) Window shopping(20)

Summary pattern of activity in JTAR
Source: Field observation (2008)

APPENDIX 7

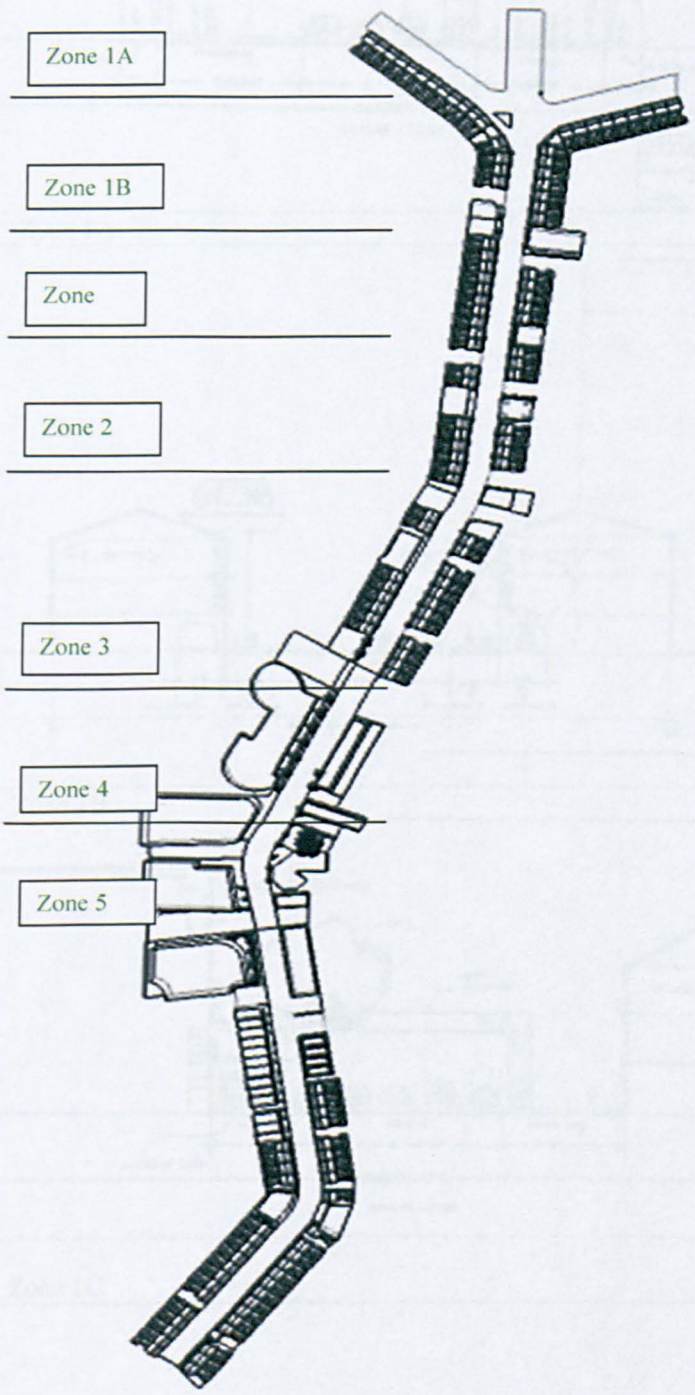
Supportive characteristics of physical elements for achieving complexity in pedestrian streets (Rapoport in Frick (2007, pp.266-267)

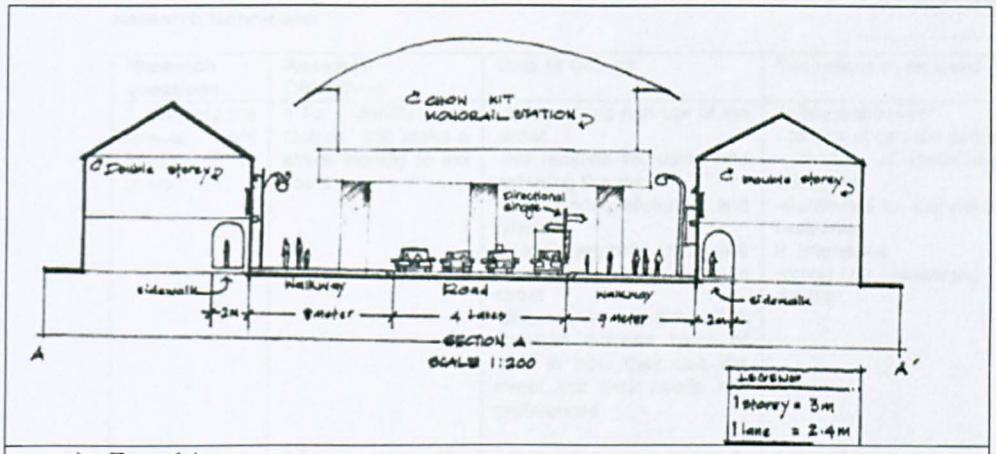
	Physical-spatial features	**Empirical values**
a) Likely to have high levels of enclosure	-Enclosing elements likely to be tall, vertical width/height ratio and low percentage of sky visible	Typically between 1:1-1:5 to 1:2-2:5
b) Likely to be narrow	-Relatively low widths average/narrow streets principal or main streets	8-12m/ 3-6m 20m
c) Likely to have complex spaces, such as many potential noticeable differences (sudden changes, irregular rhythms, transitions of various sorts)	-Variation in width, hence, variation among minimum, maximum, and average width -Many turns and twists per unit length within a given space -Articulation of space, hence, space made up of a sequence of subspaces -High contrast among these spaces and in those sequences -Presence of major projecting elements (buildings, trees, doorways, etc.) -Large number of projecting elements per unit length	
d) Likely to have short or blocked views	- Short subspaces -Limited length of views, hence division into segments, defined by horizontal blocking or by use of angles or overlapping planes. -Use of level changes to block views vertically -Use of overhead elements -Use of bends, curves, an angles -Use of cross-streets	Most below 100 m
e) Likely to have highly articulated surfaces of enclosing elements	**1) Side planes** -Large number of elements or units per unit length, hence, fine grain of enclosing surfaces (small module, variegated treatment, irregular setbacks, etc.) -High overall visual texture of enclosing surfaces -Rich treatment of each individual unit, hence rich details, cornices, steps, porches, doorways, balconies, windows, and other projecting or three-dimensional elements -Use of highly textured materials -Use of different colours -Use of irregular rhythms - Use of sudden and/or abrupt changes **2) Underfoot plane** -Use of highly textured materials compatible with walking (or to indicate non-walking areas) -Use of a variety of textures and materials -Changes in levels: ramps, steps, slopes, etc. -Changes in light and shades **3) Overhead plane**	Significantly below 9m

	-Presence of projecting elements overhead: roof overhangs, awning, arches and bridging passages over street; balconies, etc. -Large number of overhead elements per unit length -Complex and intricate roof lines, chimneys, etc.	
f) High complexity at the area level	-Large number of possible paths and large number of choice points -Indirect views hinting at further spaces (streets, courts, plazas, etc.) -Sequences of different spaces at the area level -High contrast among spaces at area level.	

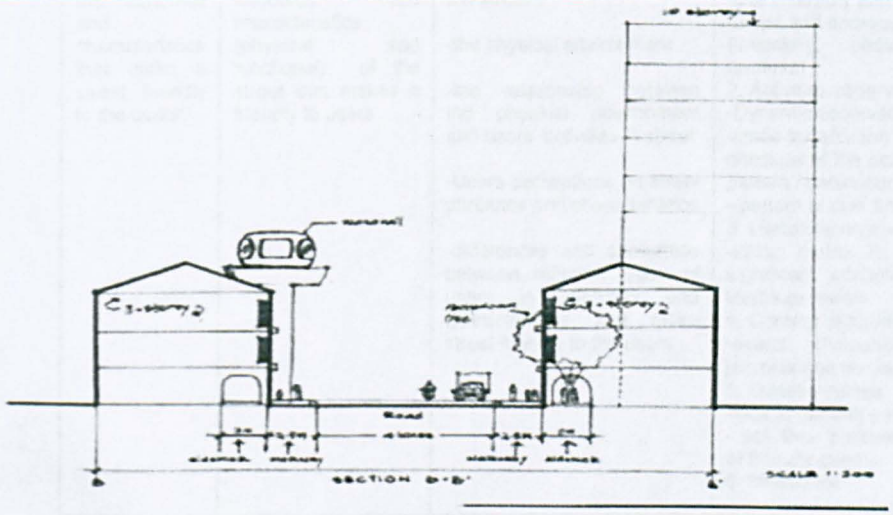
APPENDIX 8

ZONING FOR PHYSICAL SURVEY AND SECTIONS (JTAR)

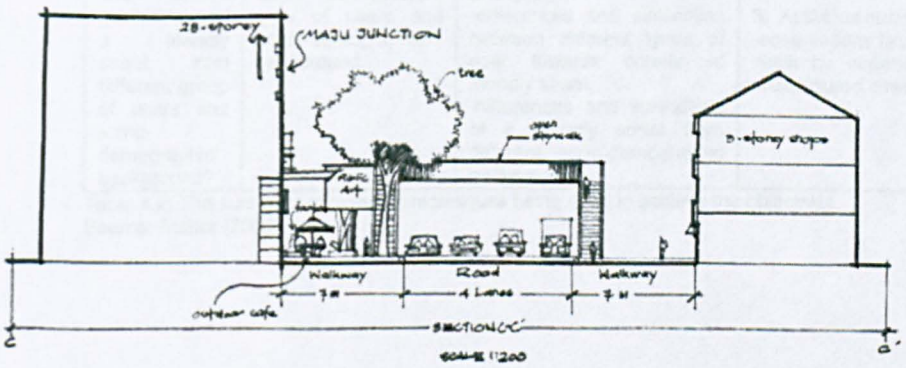




a) Zone 1A



b) Zone 1B



c) Zone 1C

APPENDIX 10

Research techniques:

Research questions	Research Objectives	Data to Collect	Technique to be used
1. Why are the streets not friendly to users?	1.To identify the factors that make a street friendly to the users	- the use and non-use of the street -the reasons for using and not using the street -their needs preferences and needs - improvements that are needed to make a good street -differences and similarities between different types of user in how they use the street and their needs and preferences	1.Questionnaires - to look at general pattern - mixture of closed-and open-ended questions -distributed to sample of town centre's residents 2. Interviews -probe for reasoning to get richer details
2. What are the attributes and characteristics that make a street friendly to the users?	2.To examine the attributes and characteristics (physical and functional) of the street that makes it friendly to users	- their uses and activities in the street -the physical environment -the relationship between the physical environment and users' activities in street -Users perceptions on street attributes and characteristics -differences and similarities between different types of users in attributes and characteristics that make street friendly to the users	1.Inventory on physical design -site inventory and physical design -maps and drawings (checklist) (inventory, photo, sketches and remarks) 2. Activities observation -Dynamic observation -static observation checklist of the activities and behaviour pattern / behaviour mapping/ photo --pattern of use and intensity 3. Literature review -using matrix to look at the most significant attributes identified in the literature review 4. Content analysis/library research -search photographs, maps reports, journals and books, etc. 5. Questionnaires -look at general pattern - ask their preferences and perception of friendly streets 6. Interviews
3. What are the differences and similarities of a friendly street from different group of users and socio-demographic background?	3. To determine the similarities and differences in the users with different type of users and socio-demographic background.	-types of user - percentage of the users -socio-demographic background -differences and similarities between different types of user towards criteria of friendly street. -differences and similarities of a friendly street from different socio-demographic backgrounds	1.Questionnaires 2. Interviews -interviews-probing for reasoning 3. Activities observations -observations (activities) -walk by observation, structured and unstructured direct observations

Table 4.2: The summary of research techniques being used to achieve the objectives
Source: Author (2008)